UNIVERSITY OF CAPE COAST

DETERMINANTS OF PROFITABILITY OF MICROFINANCE INSTITUTIONS IN AFRICA

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BY

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original work. No part of it has been presented for another degree in this University or elsewhere.

Candidate's Name: Augustine Delove Kuuterra Jirapa

Candidate's Signature: ..... Date: .....

Supervisor's declaration

I hereby declare that the presentation and preparation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by University of Cape Coast.

Supervisor's Name: Dr. Camara Kwasi Obeng

Supervisor's Signature: ..... Date: .....

ABSTRACT

Microfinance institutions (MFIs) are seen as one of key ingredients in poverty reduction in Africa. Nevertheless, for them to achieve their goal of poverty reduction, their profitability is crucial. Several factors such as outreach, institutional environment, age, size and type of MFI affect the profitability of MFIs, but labour efficiency role and credit risk effect on profitability of MFIs have seen little attention. This study therefore, sets out to investigate the potential determinants of MFIs profitability within African countries. The objectives of the study were to examine the trends in profitability of African MFIs and to estimate the determinants of profitability of MFIs in Africa.

The study used a MIX Market data for the period 2007 to 2011 for 45 MFIs in nine African countries to obtain a balanced panel. The study estimated both fixed effect and random effect. However, based on the Hausman test, the fixed effect best suited the estimation. Profitability of MFIs was measured using Return on Asset (ROA) and Return on Equity (ROE). Labour efficiency was measured as the number of borrowers per staff of MFIs whereas credit risk was measured by loan default for thirty days. To ensure robustness of the model and that the estimated equation does not suffer from omitted variable bias, other control variables were included in the model such as inflation, real gross domestic product, age, size and type of MFI.

The study finds that labour inefficiency relates to profitability of MFIs in African countries negatively. Also, credit risk exerts negative effect on profitability of MFIs in Africa. Other variables which were found to influence the profitability of MFIs include economic growth, inflation, size of MFIs and age of MFIs.

Hence, it is recommended that governments may consider providing enabling environment and policies that would foster GDP growth in order to increase funding from donors. Also, MFIs should ensure that labour employed are more efficient in delivering their services, thus reducing cost and hence increase profitability of their financial institutions.

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DEDICATION

To my family, especially my beloved daughter, Georgia Julia Jirapa.

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CHAPTER ONE

INTRODUCTION

Background to the study

Microfinance in Africa remains a difficult business. Muriu (2011), asserts that although Microfinance Institutions (MFIs) may be flourishing in commercial terms, few are profitable. Many MFIs in Africa face major constraints such as transaction costs, asymmetric information, contracts and banking in their pursuit of effectively delivering microfinance services profitably. Clearly both internal and external factors explain MFI profitability.

Again, Muriu (2011) shows that MFI profitability is driven by MFI specific factors and the institutional environment of the host country. Specifically, average profitability is higher in MFIs that are efficient, well-capitalised and have scale advantages. Moreover, proportionally higher deposit as a percentage of total assets is associated with improved profitability. However, the magnitude of this effect is very sensitive to MFI age. Consistent with the agency costs hypothesis, results show that highly leveraged MFIs are more profitable.

Institutional environment of the host economy also plays a major role in MFIs profitability. Due to the changing economic conditions and environment, profitability which is one of the most important criteria to measure performance of MFIs has come under intense pressure. Young MFIs suffer more from political instability and weak enhancement of the rule of law, which is consistent with accumulation of information capital and relationship lending. The quality of contract enforcement and overall political stability in the country could therefore

affect the extent of moral hazard that MFIs face when granting loans. Results also indicate that corruption makes it harder for MFIs to realize profits, irrespective of MFI age. Corruption may therefore reduce the probability that an MFI will invest in a country. This evidence may help guide the sequencing of institutional reforms to promote microfinance development (Muriu, 2011). Hollis and Sweetman (2001), further show that MFIs were financially sustainable for more than a century because they adapted to their economic and financial environment.

Profitability is critical to the survival of MFIs. At the moment, one of the most complicated and crucial issue in the microfinance industry is the trade-off between profitability and poverty outreach of the institutions (Hovi, 2012). Ongoing debate between profitability and outreach disputes whether microfinance could be a profit generating and self-sufficient industry or does it need to be subsidised to ensure outreach to the poorest of the poor that may need microfinance more than any other group. For example Mosley (1999); Mosley and Hulme (1998); Galema and Lensink (2009); and Hermes, Lensink, and Meesters (2011) found supporting evidence that trade-off would exist. On the other hand for example Gonzalez and Rosenberg (2006); Cull and Morduch (2007); Hishigsuren (2007); Mersland and Strøm (2010) and Quayes (2012) indicate that both profitability and outreach could be achieved at the same time depending on the situation. It has also been argued that increased profitability can result in cross-subsidisation where accessing richer, closer, more profitable clients allow MFIs to grow larger and service more remote, poorer clients (Armendáriz de Aghion & Szafarz, 2009). Deposits and aid donors are both relatively inexpensive sources of funding that can

improve profitability (Hartarska, Shen, & Mersland, 2013). Others, such as Cull, Demirgüç-Kunt and Morduch (2011), conclude that profitability and outreach are negatively related. They argue that MFIs have targeted increased loan sizes to a smaller group of more profitable, higher net worth customers at the cost of reduced outreach to poorer clients who were expensive to reach, such as women.

Recent developments in theoretical literature on transaction costs, asymmetric information, contracts and banking illustrate the challenges that MFIs must overcome to improve on performance (Becchetti & Conzo, 2011; Behr, Entzian, & Guettler, 2011; Berger, Espinosa-Vega, Frame, & Miller, 2011; Garmaise & Natividad, 2010; Gangopadhyay & Lensink, 2009).

The profitability of Microfinance providers (MFPs) can also be affected by the regulatory framework it has to follow (Basharat, Arshad, & Khan, 2014). It has been observed that GDP growth rate does not have any relation with the performance of microfinance institutions (Woolley, 2008). Microfinance institutions can perform well in terms of profitability, operational self-sufficiency and portfolio quality despite an unfavourable GDP growth rate. The study also suggests that microfinance is financially resilient to downturns in the domestic marketplace.

The connection between the profitability of an MFI and the interest rate charged is also interesting, since this can reveal whether an MFI can have the goal of both poverty reduction, i.e. of making cheap small loans, and profitability (Nørgaard Jørgensen, 2012). Giving credits to customers is a very profitable activity of the MFI since when it does; the customer pays interest on the amount

borrowed. First, the underlying assumption is that a rise in interest rates translates to higher profitability. This, however, need not be the case since higher interest rates could lead to a decline in profitability due to adverse selection and moral hazard effects (Morduch, 1999a); Cull & Morduch, 2007). But this profitable venture also has consequences or problems which may arise as a result of delay or default in loan repayments which can be so extended and interconnected. This however, derails the growth or the profitability of the banks. This moreover means that, for an MFI to be successful and profitable, it has to develop a very good strategy on how to get back the money it is lending out to the customer (Kolapo, Ayeni, & Oke, 2012).

Statement of Problem

Profitability is an appropriate mechanism for achieving long term viability and sustainability of the microfinance industry. MFIs profits are also an important source of equity, if profits are reinvested, it may result in financial stability. Similarly, Galema, Lensink and Spierdijk (2011) as cited in Tchakoute-Tchuigoua (2014), finds that investing in microfinance may be attractive to investors seeking a better risk-return profile. Their analysis suggests that investing in MFIs from Africa to a portfolio of international assets is not beneficial for a mean-variance investor. It might also be the case that firms located in economies with less developed financial markets will not only take different quantities of investment, but will also take different kinds of investment that are perhaps safer, short-term and potentially less profitable (Almeida, Campello, & Weisbach, 2011). But for

MFIs to make profit for reinvestment or for their investors, efficiency of the MFIs in the use of their resource is paramount.

The theoretical arguments on transaction cost turn to emphasise the profitability of MFIs. The argument on the effect of efficiency is unambiguous in respect of its effect on MFIs performance. This is evident from the works of Cull et al (2011), Cull and Morduch (2007) and Arun and Annim (2010) who have found negative effect of efficiency of MFIs on their profitability. However, these studies did not consider productive efficiency. Similarly, these studies employ static analysis and ignore other critical variables (labour efficiency and credit risk) that could affect profitability of MFIs. Therefore, this study examines the determinants of profitability of MFIs in Africa. While focusing on Africa, the study uses a substantially larger dataset, containing information for a large number of MFIs over a longer period of time. Secondly, the study includes credit risk of MFIs which has not been incorporated in other studies examined before.

Objectives of the Study

The general objective of the study was to determine the profitability of microfinance institutions in Africa. The specific objectives of the study was to

1. Examine the Profitability trends of MFIs in African countries
2. Evaluate the factors that determine Profitability of MFIs in African countries

Research Hypothesis

1. Ho: Labour efficiency, credit risk, inflation, economic growth, type, size and age of an MFI have no effect on profitability of MFIs in Africa.

Ha: Labour efficiency, credit risk, inflation, economic growth, type, size and age of an MFI have significant effects on profitability of MFIs in Africa.

Significance of the Study

This study is significant in so many ways. The first is that the study provides stakeholders in the Microfinance industry on the role of labour efficiency on the profitability of MFIs. Knowing how efficiency impacts on MFIs would go a long way to put policies in place to achieve its goal. Therefore, this work will inform policy makers on how profitability of MFIs in Africa can be maximised with reference to labour efficiency and credit risk. This is because productivity/efficiency of labour affects the profitability of MFIs. Again, this study adds to the existing empirical literature on efficiency and credit risk effects on profitability of MFIs by presenting empirical findings.

Scope of Study

This study concerns itself with profitability and efficiency of MFIs. The study limits itself to MFIs in Africa since profitability of these MFIs seems to be going through a dip as shown in Figure 1. The variables that are included in the model were two macroeconomic variables –inflation and GDP–, size of MFIs, Credit risk measured by PAR@30, type of MFIs which was used to control for MFI specific heterogeneity in the random effect models. The efficiency measures used for the model were staff to borrowers' ratio which measures productivity of staff to measure how productive the staff employed in MFIs under the study period were 2007 to 2011 for some selected MFIs in Africa.

Organisation of the Study

The study is organised in to five main chapters. Chapter One is the introduction. This chapter presented the background to the study, the statement of the problem, research objectives, research hypotheses, and the scope of the study as well as the organisation of the study. Chapter Two provided the literature review of the study. The chapter has been divided into sections. The first section considered theoretical review on various factors that affect profitability of MFIs i.e. issues relating to efficiency and profitability of MFIs. Conceptualisation of variables employed in various research studies were reviewed. Empirical review was also presented in the literature review. The Chapter Three deals with the methodology. The presentation focused on research design, empirical model, study area and sample size, data description and estimation technique. Chapter Four presented the results and discussion and the last, Chapter Five, focuses on the summary, conclusions and recommendations and limitation of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

The chapter gives the literature review of the study. The study presents both the theoretical review on issues relating to various factors that affect profitability of MFIs and empirical literature on profitability of MFIs, conceptualisation of variables that have been used in various studies as well as conclusion of the literature.

Theoretical Review

This study borrows theories from the mainstream banking theories that attempt to explain profitability of financial institutions. There are a lot of theories which could be applicable to the functioning of MFIs.

The Structure Conduct Performance (SCP) Model

The Structure Conduct Performance (SCP) model is one of the earliest frameworks used to examine the factors that determine the profitability of Banks (Grygorenko, 2009). According to Baye (2010), the structure of an industry refers to the factors such as technology, concentration, and market conditions. Conduct refers to how individual firms behave in the market. It involves pricing decisions (such as interest rate, commission and fees), advertising decisions, and decisions to invest in research and development, among other factors.

Performance refers to the resulting profits and social welfare that arise in the market. The Structure Conduct Performance (SCP) paradigm views these three (pricing, advertising and research and development) decisions aspects of the

industry as being integrally related and asserts that the market structure causes firms to behave in a certain way. In turn, this behaviour causes resources to be allocated in certain ways leading to either an efficient or inefficient market. This model only fails to recognise that performance can impact on structure and conduct while structure can impact on both performance and conducts. The Structure Conduct Performance (SCP) model therefore asserts that factors external to the organisations such as market conditions are primarily indirect determinants of profitability.

Mason (1939) and Bain (1951) were the earliest to suggest that profit of firms are determined by concentration level of the market. They demonstrated that profits of firms operating in highly concentrated industries are significantly higher than that of firms operating in industries with lower concentration. The Structure Conduct Performance (SCP) paradigm presupposes that a higher banking industry concentration permits the collusion of banks to set higher prices and consequently gain substantial profits (Mason (1939); Bain (1951); Stigler (1964); Heggestad (1977); Clark (1986); Ahmed & Khababa (1999); Sathye (2005); Samad (2008); Alzaidanin (2003); Pilloff & Rhoades (2002); Arby (2003)).

Expense-Preference Behaviour

It is worth noting that profitability or bank returns is not the only measure of performance as used in the theories discussed so far. There are however other theories such as the Expense-Preference Behaviour hypothesis which uses utility instead of profits as a measure of performance. In this theory, it is proposed that the main goal which managers pursue is to maximize not profit but own utility or utility of the firm, which is usually achieved via increasing salaries or other staff expenses

(Williamson, 1963). Inasmuch as MFIs are not profit oriented it is necessary to prioritise certain expenses which will not increase the cost of running the operation and hence to ensure sustainability of MFIs.

Efficiency Hypothesis

A theoretical attempt to offer an alternative explanation on the market Structure Conduct Performance (SCP) relationship was first made by Demsetz (1973), who also proposed the Efficiency hypothesis. He stated that higher profits of banks are not due to their collusive behaviour but because of high efficiency level, which in turn, leads to larger market shares that banks possess. In other words, profitability of bank is determined not by the market concentration but by bank efficiency (Grygorenko, 2009).

Bank literature pays a great deal of attention to the performance of banks (Athanassopoulos (1997); Bala & Cook (2003); Brockett, Cooper, Golden, Rousseau, & Wang, (2004); Dekker & Post, (2001); Hartman, Storbeck, & Byrnes, (2001); Kuosmanen & Post (2001); Luo, (2003); Pastor, Pérez, & Quesada (1997); Pille & Paradi, (2002); Schaffnit, Rosen, & Paradi (1997)). This is because better performing financial institutions may improve cost, revenue and financial results. Most researchers review banking literature and theory when studying efficiency in microfinance institutions (Gutierrez-Nieto, Serrano-Cinca, & Molinero (2007); Lafourcade, Isern, Mwangi, & Brown (2005); Qayyum & Ahmad (2006)). MFIs efficiency performance can be measured by some financial performance measures applied in the bank literature (Brau & Woller, 2004).

Economic theory assumes that production takes place in an environment in which managers attempt to maximize profits by operating in the most efficient manner possible (Evanoff & Israilevich, 1991). The competitive model suggests that firms that fail to do so will be driven away by more efficient ones. Efficiency is using available resources in such a way that we maximize production of goods and services (O'Sullivan & Sheffrin, 2003). A system can be called economically efficient if: Nothing can be made better off without making something else worse off. More output cannot be obtained without increasing the amount of inputs. Production proceeds at the lowest possible per-unit cost.

The overall efficiency of banks can be decomposed into scale efficiency, scope efficiency, technical efficiency, and allocate efficiency. Scale efficiency deals with operation in the range of constant return to scale, the potential productivity a bank would gain by achieving optimal size of the firm. Scale economies occur when average costs decline as bank output rises. This results from spreading fixed costs over greater volume of output (Humphrey, 1990). Economies of scale primarily refer to supply-side changes. Still, it is important to be aware of limits. Miller and Noulas (1996), find that the majority of banks in USA are too large, having moved into the region of decreasing return to scale. Scope efficiency deals with operation in different diversified areas, where producing two or more product lines in one firm is less costly than to produce them separately (Panzar & Willig, 1981).

Economies of scope refers to demand side change such as increasing/decreasing scope of/and distribution of different products. Technical

efficiency represents the capacity and willingness of an economic unit to produce the maximum attainable output from a given set of input and technology (Koopmans, 1951). Allocative efficiency occurs when inputs are combined in optimal proportions (Evanoff & Israilevich, 1991).

The shareholders of a bank have right to claim profits, and it is in their interest to maximize profit. This can be achieved by maximising revenue and/or by minimising costs. If the assumptions under perfect competition hold, we are forced to exclude revenue maximising which makes profit maximising equivalent to minimising costs. Berger and Mester (1997), suggest cost efficiencies as one of the most important economic efficiency concepts. Perfect competition can hardly be fulfilled in reality due to regulations and imperfect competition. Yet, the competition is getting harder in the microfinance market. An MFI's cost function can be represented by Berger and Mester (1997):

$$\ln C = f(w, y, z, v) + \ln \mu_c + \ln \in_c \qquad (1)$$

Where C is the variable costs, *f* denotes some functional form, w is the vector of prices of variable inputs, y is the vector of quantities of variable outputs, z is the quantities of any fixed net inputs, v is the set of environmental or market variables that may affect performance, μ_c is the inefficiency factor that may raise costs above the best practice level, and $\in_c$ is the Random error plus measurement error and luck that may temporarily give banks higher/lower cost. By using the cost function of an MFI denoted as MFI*b* it can compare its efficiency level against the cost function of a best practice MFI producing the same output bundle under the same conditions. Cost is a necessary element in determining the profitability of any financial

institution and MFIs are no exception to this. As MFIs embark on their utility objective or goal, there are costs involved and thus should be accounted for to realise the profitability accrued in managing and/or running the operations of its business.

Efficiency in MFIs

Microfinance is considered an important poverty alleviation tool. However, providing credit to the poor and low income people generally proves to be a very costly activity and providers of microfinance services are often loss making and not financially sustainable (Morduch, 2000). This is partly due to the high transaction costs in terms of screening, monitoring of borrowers and related back-office administrative costs (Hulme & Mosley, 1996). Poor and low income people lend smaller amounts of money and the individual transactions are relatively small. A typical loan size can be 50 US $ or even less for some institutions (Hardy, Holden, & Prokopenko, 2003). Moreover, poor and low income people have limited possibilities to inform about their credit worthiness and put forward collateral. Focus on decreasing transaction costs should be emphasised for the MFIs in order to increase profitability and become self-sufficient. Transaction costs arise primarily due to the limits of human ability to process information.

"*Despite whatever intentions economic actors may have to act rationally and far-sighted, the limitations on gathering, processing and communicating information constrain how rationally individuals can act*" (Macher & Richman, 2008, p. 3). There are three main sources of transaction costs. First of all individuals are limited in their ability to plan for the future. They lack the knowledge, foresight

or skill to plan for all contingencies that may arise (Simon, 1957). Second, contracting parties have difficulties developing a common language to describe the actions and states of the world. This is often due to lack of information (Hart, 1995). Third, it is often difficult for parties to communicate their plans in such a way that an uninformed third party (e.g. a court) can reasonably enforce them (Lewis & Sappington, 1991).

Lack of modern technology, particularly in remote and rural areas, is a huge challenge for MFIs regarding cost-effective operations. Low population density, poor communication infrastructure and remoteness combined with low technology is associated with high transaction costs and covariant risks (Steel & Charitonenko (2003); Johnson, Malkamaki, & Wanjau (2006). However, if the MFIs can manage to make use of technological developments such as credit cards, ATMs, cell phones and internet, they can reduce costs and operate in a more efficient way (Hermes et al., 2011). Fortunately, modern technology has expanded rapidly in developing countries. For example, 82 percent of the last 2 billion cell phones were sold in developing countries (Pasricha, 2008). Purchase transactions using credit cards (instead of cash) have also been growing fastest in developing countries (Honohan & Beck, 2007).

Being self-sustainable is a major challenge in the microfinance industry, and many of the MFIs are depending on donors (Mersland & Strøm, 2008). A self-sustainable MFI is able to repay the opportunity costs of all inputs and assets with its generated income (Chaves & Gonzalez-Vega, 1996). Many argue that is only a short-term solution depending on donors, and MFIs can only exist in the long run

if they can liberate from donors and become self-sustainable (Arsyad (2005); Maddison (2005)).

MFIs globally are becoming self-sufficient (Drake & Rhyne (2002); Robinson (2001). Research suggests that presence of subsidies increases MFI costs because it removes pressure from the management that would otherwise force them to increase efficiency (Morduch & Armendáriz de Aghion (2004); Hartarska, Caudill & Gropper (2006)). Hardy et al. (2003), argue that subsidies should be restricted to only one-time support to cover the start-up costs in MFIs since ongoing support is likely to increase moral hazard and poor management. Nevertheless, donors have played an important key role in the microfinance industry, especially in the start-up of MFIs, funding the systems and staff capacity (CGAP, 2003). Most donors are also monitoring the MFIs to verify that their donations are used in accordance with their wishes, and this can help improve the performance of MFIs (Fama & Jensen, 1983).

Poor and low income people's lack of collateral and the high cost of providing small loans in remote and rural areas are reflected in high nominal interest rates provided by the MFIs (Morduch & Armendáriz de Aghion (2004); CGAP, (2009)). Low efficiency can make interest rates higher than necessary and attention to reducing operating costs should be emphasized in order to achieve competitive interest rates (CGAP, 2003). The study demonstrated earlier in the introduction, building upon Hulme and Mosley (1996, p. 19), that the loan rate is much affected by the MFIs administrative cost. Gonzalez (2007), reports that operational costs represent about 2/3 of charges to borrowers, making them the largest component of

the interest rates. Attention should be emphasized towards identifying their drivers and quantifying them in order to improve efficiency in MFIs. Increased efficiency can contribute to decrease the cost of credit to the poor and low-income people, making lending more beneficial.

Conceptualisation of Variables

This section discusses the variables used widely in research as measures of efficiency in terms of cost and productivity.

Measuring Efficiency

Coelli, Rao, O'Donnell and Battese (2005, p.5) states that "*If information on prices is available, and a behavioural assumption, such as cost minimisation or profit maximisation, is appropriate, then performance measures can be devised which incorporate this information.*" Efficiency performance measures indicate how well an institution is managing its operations. They provide information about the rate at which MFIs generate revenue in order to cover their expenses (Ledgerwood, 1998). By comparing their efficiency performance over time and against competitors, MFIs can determine how well they are exploiting their resources and where to make improvements in their operations. While productivity indicators reflect the amount of output per unit of input, efficiency indicators take into account the cost of inputs and/or the price of outputs (Microrate & Bank, 2003).

MFIs operational cost which can be defined as: "*expenses related to the operation of the Institution, including all the administrative and salary expenses, depreciation and board fees*" (Microrate & Bank, 2003, p. 16). Operating cost has

also been studied in the bank literature by Athanassoupoulos (1997), Pastor (1999), Worthington (1998), Laeven (1999). There are three frequently used measures of cost-efficiency in the literature. These would be the dependent variables when identifying efficiency drivers and determine their effect on the overall efficiency of MFIs.

Operating expense to portfolio ratio

Operating expenses to portfolio ratio (OEP ratio) can be used as a measure of cost-efficiency and it is frequently used in the microfinance literature (Ledgerwood, 1998). The OEP ratio indicates the cost needed for the MFI to operate one unit of its portfolio. The ratio ranges from 0 to 1 where a ratio close to zero indicates a highly efficient MFI. Considering the size of the portfolio, larger MFIs can compare its cost level with smaller MFIs. Qayyam and Ahmad (2006) and Gonzalez (2007) use the OEP ratio in their papers on financial efficiency, and the rating agencies highlight the ratio in their reports. The variables (Operating expense and Average portfolio) are used as a measure of the OEP ratio (Mersland, 2009) and it is defined as:

$$OEP\ ratio = \frac{Operating\ Expense}{Average\ Portfolio} \qquad (2)$$

Operating expense to asset ratio

The operating expense to asset ratio (OEA ratio) indicates the cost needed for the MFI to operate one unit of its assets. The ratio ranges between 0 and 1. The MFIs assets can include cash, bank deposits, investments, fixed assets or portfolio. MFIs that have a large amount of its capital in non-productive assets such as fixed assets, land or property can be less efficient in

helping the poor since it is the loan portfolio that poor and low-income people benefit from. Gonzalez (2007), finds that there is a strong relationship between cost reduction and gross loan portfolio to assets. His research implies that a 10 percent increase in gross loan portfolio to assets yields a seven percent decrease in costs. Vanguri (2008), suggests from his research on capital allocation in MFIs that allocating more capital towards loan portfolio will yield better returns.

Berger and Humphrey (1997), review 130 studies on financial institutions and suggest that banks that have high loans to assets ratios tend to have higher profit efficiency. The value of assets has been included in financial efficiency models by Luo (2003), Seiford and Zhu (1999). In the banking industry, the ratio of operating expenses to the value of total assets is an accepted indicator of unit operating costs (Humphrey, Willesson, Bergendahl, & Lindblom, 2006). The following variables (Operating expense and Average asset) are used as a measure of the OEA ratio (Mersland, 2009) and it's defined as:

$$OEA = \frac{Operating\ Expense}{Average\ Asset} \qquad (3)$$

Cost per Credit client

Cost per credit client (CC) or cost per borrower indicates the average cost of providing an active credit client (Microrate & Bank, 2003). It is different from the two other efficiency measures since it is not a ratio but an absolute value measured in US $. Donors and investors pay special attentions to the cost per client since it indicates the cost of reaching out to one more client. However, measuring efficiency

only by looking at the cost of maintaining an active credit client can give an incomplete picture.

A low indicator can indicate that MFIs are putting little resources into screening and monitoring borrowers. In their paper on financial performance in Africa, Lafourcade et al. (2005), use cost per borrower as a measure of efficiency. Their findings conclude that MFIs achieve higher efficiency by keeping cost per borrower low. This is also supported by Qayyum and Ahmad (2006) and Mersland and Strøm (2008). UNCDF (2005), states that efficiency should preferably be measured through cost per borrower.

Productive efficiency

The demand for labour is concerned with the level of employment desired by business firms. The standard model of labour demand in economics is the neoclassical marginal productivity theory of demand. This measures the increment in production contributed by each additional worker hired. The marginal product is defined as the increase in total product from adding one more unit of labour. The second productivity measure is the average product of labour which means the average amount of output produced per worker.

Another measure of labour efficiency is the X efficiency measure which could be obtained through combining factors of production. This could be done by the use of data envelope analysis or meta frontier.

The productive efficiency measure links the performance of staff to the output of MFIs (Hudon & Barkunhol, 2008). This measure is used as a measure of staff efficiency. The higher the ratio, the less efficient the MFIs are presumed to be.

This is expressed as a ratio of client or asset of the MFI. For example, one of such indicators is staff per borrower, loan officer per client, etc. The more efficient an MFI uses less staff to serve large client of MFIs. It should be emphasised that the nature of the data available could not permit the use of a more rigorous measures thus the marginal productivity theory of labour and X efficiency. It must be noted that the measure used here does not affect the result in any significant way.

Empirical Review

Factors that affect Profitability of MFIs

Owing to limited literature on microfinance performance, this sub-section borrows heavily from the banking literature, since MFIs offer banking services to the poor. Existing literature defines profitability of a financial intermediary as the return on assets (ROA) or the return on equity (ROE). This is measured and/or expressed as a function of internal and external factors. Internal factors are those influenced by management decisions or within the control of firm management. Such factors include firm size, capital adequacy, credit risk provisioning, and efficiency in the management of operating expenses. The external determinants include macroeconomic and industry-specific factors which reflect the economic, legal and business orientation within the context where the financial institution operates. A number of explanatory variables have been proposed for both categories depending on the nature and purpose of each study.

There is no convergence on the empirical evidence on firm size. Significant predictions of theories are not supported, and interesting regularities in the data are not predicted, thus anecdotal explanations abound.

Sufian and Habibullah (2009), examine the determinants of the profitability of the Chinese banking sector during the post-reform period of 2000-2005 and conclude that the impacts on bank profitability depend on the bank types. During the period under study, they find size to lower city commercial banks profitability. Along the same vein Wu, Chen and Shiu (2007), investigate the main determinants of the bank profitability in China. They find that the more assets a bank has, the worse will be its return on assets (ROA). Both studies render support for the diseconomies of scale. Consistent with this finding, Kosmidou and Pasiouras (2005), find diseconomies for larger banks which apply to both domestic and foreign banks. The negative coefficient indicates that in both cases, larger (smaller) banks tend to earn lower (higher) profits and gives credence to previous studies which include Kosmidou, Pasiouras, Zopounidis, and Doumpos, (2006); 2006; Bikker and Hu, (2002); Demirgüç-Kunt and Huizinga, (1999); Boyd and Runkle, (1993) that found either economies of scale and scope for smaller banks or diseconomies for larger financial institutions.

Contrasting findings confirming economies of scale are evident. Using a self-constructed global data set on MFIs collected from third-party rating agencies, Mersland and Strøm (2009), examine the relationship between MFI performance and corporate governance while controlling for MFI size. Using random effects panel data estimations they find that financial performance improves with firm size. These findings are consistent with Cull and Morduch (2007). In the banking industry Zopounidis and Kosmidou (2008), uses total assets of the bank to control for size and similarly find a positive impact on profitability which confirms

Athanasoglou, Delis and Staikouras (2006), Beck, Demirgüç-Kunt, and Maksimovic. (2005), Naceur and Goaied (2001), Spathis, Kosmidou and Doumpos (2002), Altunbaş, Gardener, Molyneux, and Moore (2001), Berger and Humphrey (1997), who similarly find large banks to be more profitable, consistent with the predictions of modern intermediation theory.

There has been an extensive literature on efficiency in the management of operating expenses and firm performance. Sufian and Habibullah (2009) investigate the determinants of the profitability of the Chinese banking sector and find inefficiency in operating expenses management to impact negatively on bank profits. This confirms Athanasoglou, Brissimis and Delis (2008), who applies a GMM technique to a panel of Greek banks covering the period 1985-2001 and similarly finds operating expenses to significantly impact negatively on bank profitability. They are however quick to point out that the negative effect means that there is a lack of competence in expenses management since banks pass part of increased cost to customers. Consistent findings have been documented by Zopounidis and Kosmidou (2008), who examine the determinants of performance of Greek banks during the period of EU financial integration (1990-2002), Kosmidou and Pasiouras (2005), Athanasoglou et al. (2006) and Kosmidou et al. (2006). Previous evidence on the banks' profitability include Guru, Staunton and Balashanmugam (2002) Bourke (1989) and Molyneux and Thornton (1992).

Similar estimation results have been reported in microfinance literature. Cull and Morduch (2007), conclude that the impact of costs on profitability of MFIs depends on an institution's lending methodology. Contrasting findings are evident.

Hollis and Sweetman, (2001), investigate the impact of capital structure on non-interest operating costs using data on Irish loan funds. They find that higher net income is associated with higher salaries and other non-interest costs. Indeed, higher capital-deposit ratios led to higher operational costs even after controlling for net income. These findings suggest that depositors could assist in controlling operational costs in MFIs.

The issue of whether a firm's age matters has generated large amounts of empirical research. In the banking industry and contrary to theoretical predictions, Wu et al. (2007) establish that the longer a bank has been in existence, the worse the return on assets (ROA). Similarly, Beck et al. (2005) shows that older institutions perform worse which imply that the new entrants into the market are better able to pursue new profit opportunities.

Moreover, newer institutions appear to enjoy more autonomy in their decision-making, and are more willing to innovate. Inconsistent findings in microfinance have been documented by Cull and Morduch (2007) who concludes that an institution's age is significant and positively linked to financial performance. Clearly the evidence remains inconclusive and contestable.

Both theoretical and empirical studies show that capital adequacy is important in determining bank profitability. Sufian and Habibullah (2009), find capital to have a positive impact on bank profitability in China. This confirms Athanasoglou, et al. (2008, 2006) and Zopounidis and Kosmidou (2008) who also finds a positive and significant effect of capital on bank profitability, reflecting the sound financial condition of banks. Boubakri, Cosset, Fischer, and Guedhami

(2005), examine the post privatisation performance of 81 banks from 22 developing countries and establish a similar 15. Rather than being financed by equity-holders these community based organizations were financed by deposits and capital which comprised of donations and accumulated profits and which created problems of managerial moral hazard result. Consistent previous findings include Goddard, Molyneux, and Wilson (2004), Naceur and Goaied (2001), Molyneux and Thornton (1992), Berger (1995) and Demirgüc-Kunt and Huizinga, (1999).

Empirical evidence on the impact of quality of loan portfolio on profitability is mixed. Mersland and Strøm (2009) do not find credit risk to be a significant determinant of performance. On the contrary, Athanasoglou, et al. (2008) finds credit risk to be negatively and significantly related to bank profitability which confirms previous findings by Athanasoglou et al. (2006). Additionally, Zopounidis and Kosmidou (2008) evidence a negative and statistically significant impact of loan loss reserves to loans on profitability, which implies that financial institutions can reduce the variability of reported income by making higher provisions than necessary when credit quality and net income are high, during favourable economic conditions. This finding lends support to Boubakri et al (2005), who using the past due loans to total loans ratio, and a measure of interest rate risk that is equal to short term assets minus short term liabilities over total assets arrives at the same conclusion. Few studies evidence a positive relationship between credit risk and performance. Sufian and Habibullah (2009), findings suggest that credit risk has positive impacts on the state owned

commercial banks and joint stock commercial profits which is consistent with Angbazo (1997). Evidence from microfinance is lacking.

Financial institutions performance is sensitive to prevailing macroeconomic conditions. Using a panel of Italian banks, Marcucci and Quagliariello (2008) finds that loan loss provisions and bad debts increase during economic growth slump. Laeven and Majnoni (2003), provide similar evidence in a cross-country comparison. Athanasoglou et al. (2008), similarly find a positive impact on bank profitability in the Greek banking industry which confirms Athanasoglou et al (2006) and Beck and Hesse (2006). Zopounidis and Kosmidou (2008) finds growth of GDP to have a significant and positive impact on profitability, consistent with Kosmidou, Tanna and Pasiouras (2005), while inflation has a significant negative impact. Athanasoglou, et al. (2008), find inflation and cyclical output to affect the performance of the banking sector negatively, while Wu et al. (2007), conclude that per capita GDP has a positive impact. Kosmidou and Pasiouras (2007), find inflation to be positively related to domestic banks, implying that during the period of their study the levels of inflation were anticipated by domestic banks.

The results about the impact of per capita incomes on domestic banks profitability are consistent with those of Kosmidou et al. (2005), Zopounidis and Kosmidou (2008). Other similar previous findings include Neely and Wheelock (1997), who explore the profitability of a sample of commercial banks in the US over the 1980-1995 periods. Empirical evidence suggests that better institutional

environment will have a positive impact on net interest margins (see for example Easterly & Levine, 2003).

MFIs operating in countries with better protection of property rights are also able to reach more borrowers (Hartarska & Nadolnyak, 2007). Existing empirical studies on corruption shows a negative impact on performance. In Uganda, for instance, bribes increase companies' operating cost by about 8 per cent (Ng, 2006). Gelos and Wei (2002), show that endemic corruption is associated with lower investment from international funds. They also find that during financial crises, international funds flee corrupt economies by a greater amount than their transparent counterparts.

Even though these studies show that it is possible to conduct a meaningful analysis of MFI profitability, there is no single study that provides definitive proof for any claim in microfinance profitability. Moreover some issues are not dealt with sufficiently. First, a vast amount of the literature has examined determinants of profitability at the bank level. Second, in most of the literature, the econometric methodology is not adequately described. To conclude therefore, the study review of banking literature shows that there is only limited empirical evidence on some of the issues under consideration and scant in microfinance. The few studies available within the realm of microfinance remain anecdotal and contestable.

Conclusion

The chapter reviewed literature on microfinance, the needs of MFIs and their products and services that they offer to clients. Concepts of microfinance, and theories of microfinance were reviewed in this chapter. From the review, it was

clear that a lot of factors affect MFIs profitability of which include efficiency of MFIs. The review suggests that, efficiency of MFIs could be measured at different levels, thus in line with this study was the productive efficiency measure.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter used a systematic framework that gives the study the empirical model for the analysis and other estimation techniques adopted in carrying out the study. It began with the design of the study. Light was also shed on study area and population together with the sample. The specification of the empirical model for the study follows immediately. Subsequently, the description of the data sources followed by the estimation procedures.

Study design

The study used quantitative research design in the frameworks of positivist philosophy to assess the profitability of MFIs in Africa. Quantitative design follows the path of using econometric techniques to examine either some cause and effect relation or association. According to Levy (2008), studies that use quantitative tools and techniques that emphasise measuring and counting, are called positivists. Positivists' philosophy assumes that reality is fixed, directly measurable, and knowable and that there is just one truth, one external reality. The positivist paradigm operationalises concepts so that they can be measured, formulate hypotheses and then test them; thus, an objective viewpoint without interfering with the phenomena being studied. Hirschheim (1985), contended that, knowledge that claims not to be grounded in positivist thought are simply dismissed as scientific and therefore "invalid". This view is indirectly supported by Levy (2008) who, in a review of 902 IS research articles; found that all the empirical studies were

positivist in approach.

The major strength of this research design is that, it maximises objectivity, replicability and generalisability of the findings. The quantitative research design ensures that biases on the part of the researcher are minimised and thus ensures that generalisations can be made with reference to the conclusions of the study. Quantitative research designs are either descriptive or experimental (subjects measured before and after a treatment) (Sarantakos, 2005). Given the fact that the study seeks to examine association and effect, quantitative research design provides an accurate and valid representation of the variables that are relevant to the objectives of the study and descriptive research designs are claimed to provide a meaningful picture of events.

Study Area

African microfinance is as diverse as the continent itself. An array of approaches have been used, ranging from traditional kinship networks and Revolving Savings and Credit Associations (ROSCAs) to NGOs and development projects, and funded by both the informal and formal financial sectors, as well as domestic and international donors. Microfinance is aimed at individuals who were previously considered "unbankable" by larger banking institutions. These are individuals who are possibly dealing in small amounts of money each day, living in hard-to-access areas, without credit histories or who do not meet "traditional requirements" within the banking sector. For example, in many parts of the world, women are not allowed to own property. Since banks often require collateral for

loans, women are often excluded because they do not have access to collateral against which to secure the loans.

The microfinance industry has recorded much success and has enhanced the spate of the success stories of poverty reduction. The Microfinance outlook for the sub-Saharan African countries suggests a growth rate of 15 to 20%. Thus, its growth is a very rapid one compared with other parts of the world. The MFIs operations in sub-Saharan Africa have diversified sources of fund. Their sources of fund range from deposit, loans, international equity, local debt and international debt. Similarly, the MFIs operation ranges from deposit taking to lending of microcredit, micro-insurance and organising workshop support for entrepreneurs. The MFIs in sub-Saharan are predominantly foreign owned with the most popular once being Opportunity International, Advans and others.

Population

The study used information of microfinance institutions from the Microfinance Exchange (MixMarket) dataset. The Microfinance institutions that report to the MixMarket is based on voluntary activities. This leaves a lot of missing data obtained for the study. Therefore the sample was based on MFIs who have observations for all the variables used for the study for the period 2007-2011. That reduced the listed MFIs to 45 MFIs with the complete set of data. The countries used in the regression are Ghana, Nigeria, Malawi, Tanzania, Togo, Benin, D.R Congo, Rwanda and Cote d'Ivoire. It must be stated that the countries in the Northern Africa were not included since they are captured as part of Middle East and North Africa (MENA) region in the MixMarket data set.

Empirical model

The empirical model was developed based on the efficiency hypothesis which argues that institutions with lower transaction cost are more efficient and are able to generate more profit and to stay in business. This is therefore presented in equation 4. It is worth noting that the dependent variables are ROA and ROE.

$$ROA_{it} = {}_0 + {}_1 Age_{it} + {}_2 GDP_{it} + {}_3 LabEff_{it} + {}_4 CPI_{it} + {}_5 Type_{it} + {}_6 Size_{it}$$

$$+ {}_7 CreditRisk_{it} + {}_8 BANCOP_{it} + u_{it} \qquad (4)$$

Measurement of variables

The measurement and expected signs of the variables used in the model are presented in Table 1.

Table 1: Measurement of variables

Variables	Definition of Variables	Justification	Sign
Return on Asset (ROA)	Net income expressed as a ratio of total assets	Hartarska (2005), Mersland & Strøm (2008), Tucker & Miles (2004)	+/-
Return on Equity (ROE)	Net income per total equity	Mersland (2009)	+/-
Macroeconomic variables:			
Real GDP	Nominal GDP at current prices divided by the price deflator		+

CPI	Consumer Price Index		-
MFI characteristics:			
Type of MFI	Whether the MFI is commercial bank, rural bank, credit union, NGO, non-bank financial institution or other.		+/-
Age of MFI	Mature Young New		+/-
Size:	Size is measured as gross loan portfolio		+
Credit risk	Loan default for 30 days (PAR@30)		-
BANCOP	Bank competition measured by commercial bank concentration	Hudon & Barkunhol (2008)	-
LabEff	Measured by using productivity of labour as measured by borrower per staff		+/-

Data source

Data for over 100 MFIs that report to the Mixinfo.com were used in the analysis. The data covers MFIs from Africa with the exception of those in Northern African countries since they are considered as part of Middle East and North Africa (MENA) region. The data ranged from the period 2007-2011. The scope of the data includes MFI profitability, outreach, efficiency data, type of MFI and the age variable were used. MIX Market data is the most reliable data on microfinance as of now and it is most widely used dataset in terms of microfinance research. The data was complemented with macroeconomic variables from World Development Indicators. These variables were Gross domestic product (GDP) per capita and Inflation to capture economic instability. World Development Indicators (WDI) consist of the primary World Bank collection of development indicators that include data from 209 countries spanning from 1960 to 2015. WDI is the most accurate development data, with national, regional and global coverage. It is the source of country level macroeconomic indicators and is publicly available.

The Estimation Procedure

This section explains in detail the various estimation techniques employed in the study. The panel unit roots and panel estimation used to analyse the data.

Panel Unit Root Tests

The panel literature on unit roots and nonstationary emphasises panels where both the cross sectional and time dimensions are large. Nonstationary data in short panels have therefore received lesser consideration in literature. Fisher (1932), Levin and Lin (1992) and Harris and Tzavalis (1999) are among the first to

consider units roots tests in short panels. The Fisher test is an exact and non-parametric test, and may be computed for any arbitrary choice of a test for the unit root in a cross-sectional unit. Thus, is called the inverse chi-square test and most widely used in meta-analysis. This notwithstanding, the study performed various panel unit root test to ascertain the stationarity status of the strictly time dependent variables used in the study. Various unit root tests abound for panel data, specifically Hadri (1999); Breitung (2001); Levin, Lin, and Chu (2002); Im, Pesaran, and Shin (2003), have all developed panel-based unit root tests. Most panel unit root test take the form:

$$\Delta y_{it} = \circ_i y_{i,t=1} + \sum_{L=1}^{pi} \__{il} \Delta_{yi,t=L} + a_i d_{it} + £_{it} \qquad (5)$$

Where d_{it} are the deterministic components, $\circ_{it} = 0$ means the process has a unit root for individual i, and $\circ < 0$ means that the process is stationary around deterministic part.

Estimation Techniques

To ensure the robustness of the estimation results irrespective of the econometric technique, three different panel data techniques was employed for the exercise. The study first estimates the model using standard Pooled Ordinary Least Squares (OLS) estimators, which ignores the country effects. Fixed and Random effects panel estimation techniques was also employed in the study to control for unobserved effects which are ignored by the pooled OLS estimation procedure. However, fixed and random effects methods do not also control for potential endogeneity.

Pooled OLS

Consider a linear panel data model

$$y_{it} = x'_{it} \quad + £_{it} \; i = 1..., N \quad t = 1..., T \qquad (6)$$

This model may appear overly restrictive because is the same in each time period. Parameters changing over time can however be allowed for by appropriately choosing x_{it}. The fact that x_{it} is written for some elements does not mean those elements may not be time varying. The usual assumptions for cross section data analysis is assumed for the model. The two assumptions required for pooled OLS to consistently estimate are as follows:

Assumption 1: $E(x_t \varepsilon_t) = 0$, t= *1,2…..T.*

Assumption 2: $rank\left[\sum_{t=1}^{T} E(x_t' x_t)\right] = K$

While Assumption 1 does not talk about the relationship between x_s and ε_t for $s \neq t$, the idea of perfect linear dependencies among the explanatory variables is in effect ruled out by Assumption 2. In order to apply the usual OLS statistics from the pooled OLS regression across *i* and *t*, homoscedasticity and no serial correlation assumptions must be assumed. The weakest forms of these assumptions are the following:

Assumption 3:

(a) $E(\varepsilon_t^2 \,|\, x_t' x_t) = \sigma^2 E(x_t' x_t), \;\; t = 1, 2, ..., T, \;\; where \; \sigma^2 = E(\varepsilon_t^2) \;\; for \; all \; t;$

(b) $E(\varepsilon_i \varepsilon_s x_t' x_s) = 0, t \neq s, t, s = 1, ...T.$

The first part of Assumption 3 is a fairly strong homoscedasticity assumption; sufficient is $E(\varepsilon_t^2 \mid x_t) = \sigma^2$ for all t. This implies that not only does the conditional variance not depend on x_t, but also the unconditional variance is the same in every time period. The conditional covariance of the errors across different time periods is restricted to be zero by Assumption 3b. In fact, since x_t almost always contains a constant, assumption 3b requires at a minimum that $E(\varepsilon_i \varepsilon_s) = 0, \ t \neq s.$ Sufficient for 3b is $E(\varepsilon_i \, \varepsilon_s \mid x_t' x_s) = 0, t \neq s, t, s = 1, ...T.$

Assumption 3 implies more than just a certain form of the unconditional variance matrix of $u = (u_1, ..., u_T)'$. Assumption 3 also implies $E(u_i u_i') = \sigma^2 I_T$ denoting constant unconditional variances and zero unconditional covariances. However, it also effectively restricts the conditional variances and covariances. Heteroscedasticity and serial correlation can be accounted for to guarantee correct inference and estimates.

Fixed Effects (FE) versus Random Effects (RE)

In econometrics literature, when dealing with correlation between the time-invariant error term (α_i) and the explanatory variables two different assumptions are made. The outcomes of the assumptions are Fixed Effects (FE) and Random Effect (RE) models. For Random Effect models, unobserved country-specific time-invariant error terms are assumed to be uncorrelated with the explanatory variables while Fixed Effect (FE) models assume that the unobserved country-specific time-invariant effects are correlated with the explanatory variable. For Random Effects, country-specific characteristics are therefore taken as explanatory variables and

included in the model. These individual characteristics need to be well specified in the estimation model. Some of the country-specific characteristics may include institutional, cultural, historical and geographical factors. These characteristics are often unique for each country and are time-invariant.

From equation (6), whereas the time-invariant country specific effects ($«_i$) cannot be easily observed, the explanatory variables (x_{it}) can be easily observed. The Fixed Effect model is therefore used when it is assumed that the countries possess certain individual characteristics which are unique to them and are time-invariant. Country-specific time-invariant effects cause the problem of endogeneity and subsequently bias the estimates. Endogeneity is directly related with model uncertainty since several variables are bi-directional leading to causation links (Artelaris, Arvanitidis, & Petrakos, 2007). Endogeneity occurs when the dependent variable have something to do with explaining itself as well (Levine, Loayza & Beck, 2000).

The FE model eliminates the time-invariant effects from the estimation by using the within transformation to demean the variables. From equation (6), the within transformation process is described in the equation below:

$$y_{it} - \overline{y_i} = (x_{it} - \overline{x_i}) \quad + («_i - \overline{«_i}) + (¬_{it} - \overline{¬_i}) \tag{6.1}$$

Where $\overline{y_i} = \frac{1}{T}\sum_{i=1}^{T} y_{it}$, $\overline{x_i} = \frac{1}{T}\sum_{i=1}^{T} x_{it}$, $\overline{¬_i} = \frac{1}{T}\sum_{i=1}^{T} ¬_{it}$, and $\overline{«_i} = «_i$.

The within transformation process described in equation (6.1) calculates the mean of the variables and subtracts the calculated mean from their actual values. The mean value ($\overline{«_i}$) for the country-specific error terms ($«_i$) is the same for actual

values since they do not change over time. The country-specific effects through this process are controlled for from the equation. The Hausman test would be employed to choose between random effect and fixed effect for discussion.

Diagnostic tests

There is a need for various tests to be conducted on this study to ensure efficient, reliable, unbiased, consistent and precise prediction of the model to be estimated. Outliers and influential observations could lead to biased result when it comes to regression analysis. Therefore, to deal with outliers and influential observations, the study will employ the Cooks D outlier and influential observation test. The presence of heteroscedasticity, multicollinearity, outliers and unit roots will affect the results. Hence, there is a need to carry out these tests in the analysis.

Heteroscedasticity

Econometric literature clearly points out that, the problem of heteroscedasticity occurs when variance of the error terms differ across observations. Gujarati (1995), explains that the outliers in the variables, incorrect data transformation, incorrect functional forms and omission of important variables affect the variance of the error terms of the dependent variables not to be constant. To detect the presence of heteroscedasticity in the study, the white test will be applied. The problem can be solved by using robust standard errors. The robust standard errors relax OLS assumption that errors are both independent and identically distributed.

Multicollinearity

Multicollinearity exists when two or more independent variables are correlated in a regression model. There are two main types of multicollinearity: Perfect and Imperfect Multicollinearity. Perfect multicollinearity occurs when one of the regressors is a perfect linear combination of the other regressors. Imperfect multicollinearity also occurs when one of the regressors is high but not perfectly correlated with the other regressors. Multiple binary or dummy variables are potential sources of multicollinearity. Although OLS estimators are best, linear, unbiased and efficient, their variances and covariances will be large. The t-ratio of one or more coefficients become statistically insignificant whilst the R-squared tends to be very high (Gujarati, 1995). The afore-mentioned consequences make regression estimates less precise and reliable. Several ways can be used to detect the presence of multicollinearity. This includes auxiliary regressions, correlation matrix, eigenvalues and condition index. But this study will apply the variance inflation factor (VIF).

$$\mathbf{VIF} = (1/\ 1- R^2_j)$$

Where, R^2_j is the coefficient of determination for a regression with independent variable j on all the other independent variables. A VIF of 10 and above indicates a multicollinearity problem (Gujarati, 1995).

Conclusion

The study used quantitative research design in the frameworks of positivist philosophy to assess the determinants of profitability of MFIs in Africa. The MFIs in sub-Saharan Africa which excludes the MENA region was the study area. The study used information of microfinance institutions from the Microfinance Exchange (MixMarket) dataset from 2007 to 2011. The data set constituted 45 MFIs from Ghana, Nigeria, Malawi, Tanzania, Togo, Benin, D.R Congo, Rwanda and Cote d'Ivoire who have observations for all the variables. Variables included in the study were ROA, ROE, which constitute the dependent variables whilst the independent variables; labour efficiency, credit risk, bank competition, size of an MFI, age of an MFI, type of an MFI and some macroeconomic variables like real GDP and inflation. The study first conducted stationarity test using Fisher type and the Im Pesaran and Shin (IPS) test to panel data. Further, the model was first estimated using standard pooled OLS. Fixed and Random effects panel estimation techniques was also employed in the study to control for unobserved effects which are ignored by the pooled OLS estimation procedure whereas the Hausman would be employed to select the model that bests suits the estimation. Some diagnostic test were carried out after the estimation to check for the absence of heteroscedasticity, serial correlation and omitted variable test

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the results and discussion of the study. The first issue discussed is the summary statistics of the variables, the trend analysis of profitability of MFIs in Africa and the unit root tests for stationarity. The chapter then presents the results and discussion of the regression estimates followed by the diagnostics test for the models.

Summary Statistics

Generally, descriptive statistics or summary of variables are done to check for the distribution of the data or the variables. Table 1 illustrates these statistics. It is observed that all the variables except return on equity (ROE) had positive average values (means). The minimal deviations of the variables from their means as shown by the standard deviations give an indication of slow rate of fluctuation of these variables over the period except GDP and inflation. The return on asset had a minimum of -0.8507 and a maximum of 0.1812. This indicates that from the return of assets, the MFIs are less profitable. Similarly the average of ROE was negative. Thus, MFIs as indicated earlier had a negative profitability level using the two profitability indicators. They are likely to be insolvent should they experience any credit risk shock and this probably warranted the recapitalisation and maintaining of a 10% capital adequacy ratio of all MFIs in Africa (Afriyie & Akotey, 2013).

Table 2: Summary statistics of the variables

Variable	Mean	Std. Deviation	Min	Max
ROE	-8.1220	0.0862	-3.989	1.828
ROA	-0.0465	0.1623	-0.8507	0.1812
LabEff	0.5381	0.314	0.195	1.226
PAR@30	0.4647	0.388	0	0.173
BANCON	0.1997	0.227	0.001	0.799
GDP	4.9000	9.1700	0	3.4400
AGE			1	3
SIZE	1.7142	0.460	1.65	5.086
Inflation	5.9000	3.1700	3.2	10.440
Type			1	5

Source: Author's estimate (2015)

Note: GDP is logged, AGE and Type are categorical variables whereas the rest are ratios

The other variables had positive mean and standard deviations. The GDP and inflation had means of 4.9 and 5.9 respectively. The highest category of age of an MFI was 3. The categories were new which was assigned 1, young represented by 2 and mature represented by 3. The type of MFI variable was also measured in categorical manner. These variables were represented on a nominal scale of 1 to 5.

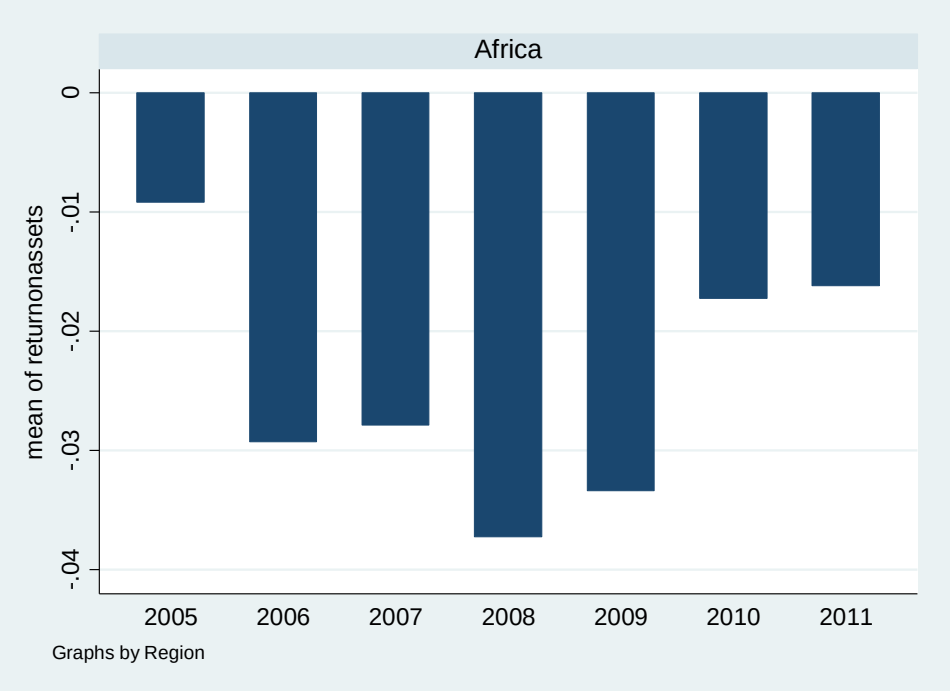
Trends in Profitability

In order to examine trends in MFIs profitability, the study sought to use return on assets and return on equity as profitability measures. It is worth noting that trends in ROA and ROE reveal and reinforces the negative means recorded under the summary statistics.

Return on Assets

Return on assets is an indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. The return on assets is presented in Figure 1, is consistently negative for MFIs in Africa. The graph of the means indicates that on average, MFIs in Africa have recorded negative returns on its total assets. This pattern confirms the link between efficiency and profitability existing in literature on Microfinance (Annim, 2010). From the figure, ROA fluctuated between -.01% to approximately -.04% for the years between 2006 and 2011. However, in 2009 the negative ROA tend to reduced steadily though still negative through to 2011, hence showing improvement in levels of efficiency. This efficiency could be attributed to the fact that, MFIs in Africa are trying to wean themselves from donor support or subsidies which require that the operational expenses be reduced.

Figure1: Return on Assets

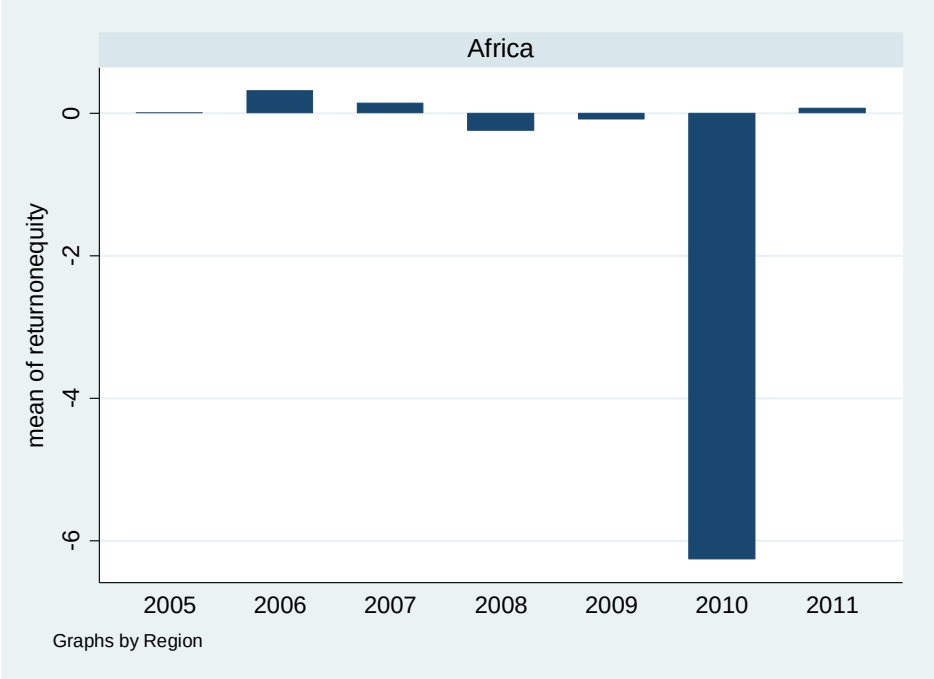


Source: Author's estimate (2015)

Return on Equity (ROE)

Return on Equity is the amount of net income returned as a percentage of shareholders equity. ROE measures a company's profitability by revealing how much profit a company generates with the money shareholders have invested. The return on equity is presented in Figure 2. The description on ROE of MFIs in Africa shows that profitability peaked in 2006. Until 2010, profitability decreased steadily. The weighted average values on the graph indicates that ROE are negative in some years, more volatile and more outlying as observed in 2010. This could be attributed to the fact the debt to equity ratio is the main determinant for the volatility for the leverage adder (Flosbach, 2015). The leverage adder is determined by the debt to equity ratio and the spread between cost of debt and return on assets.

Figure 2: Return on Equity



Source: Author's estimate (2015)

Unit root test

As with any data that contains time series, is important to explore the time series properties of the data in order to avoid spurious regression. To ensure that all the variables are stationary, the Fisher type and IPS panel unit root test was used. The results from the unit root test are presented in Table 3.

The unit root test in Table 3 suggests that the panel series ROA is stationary at levels. The unit root test using the Fisher type ADF test showed that, the inverse chi square which is good for finite sample was statistically significant at 1%. Therefore the null hypothesis of panel contains unit root was rejected in favour of the alternate hypothesis. All the remaining tests for large panel were also significant at 1%. This showed that the stationarity test was consistent for both finite panel size

and large panel. Based on this test, it is concluded that ROA and ROE were stationary at levels.

LabEff was also found to be stationary at levels. All the statistics used were significant at 1%. This was due to the rejection of the null hypothesis of no unit root. GDP, Inflation, size, BANCON and PAR@30 the remaining variables were also stationary at first difference. However, SIZE was not stationary at first difference when the Fisher type PP test was used to test for the order of integration.

Table 3: Unit root test using Fisher test

Variable	Inverse chi-squared(20) P	Inverse normal Z	Inverse logit t(49) L	Modified inv. chi-squared Pm
ROE	96.7339***	-5.124***	-7.550***	12.1327***
ROA	96.7339***	-5.1244***	-7.5504***	12.1327***
LabEff	22.7051**	-8.9102***	-4.1535**	-7.1534***
PAR@30	134.7163***	-5.4925***	-10.6819***	18.1382***
BANCON	55.0908***	-3.6806**	-4.2808***	5.5483***
SIZE	-4.6099***	-4.467***	-4.6099***	-4.4674***
INFLATION	118.9314***	-4.667***	-8.7959***	15.6424***
GDP	35.8792**	-2.9641*	-2.7804***	2.5107**

Source: Author's estimate (2015)

*, **, *** denotes 10%, 5% and 1% significance level respectively

To be sure of the unit root test, the IPS (Im, Pesaran and Shin) unit root test was also used as a robust check on the unit root test. The result presented were test done for the scenario where time trend and no trend was included in the unit root test. The results are presented in Table 3.

Table 4: IPS panel unit root test

Variable	No trend Included	Trend
ROE	-5.2231***	-13.9186***
ROA	-2.0547*	-2.3317**
LabEff	-7.0596***	-16.4094***
PAR@30	-4.2876***	-6.6115***
BANCON	-2.1862**	-2.0855*
SIZE	-2.5707***	-3.2788***
INFLATION	-1.8535*	-3.4788***
GDP	0.1749	-5.7682***

Source: Author's estimate (2015)

*, **, *** denotes 10%, 5% and 1% significance level respectively

The result from the unit root using the Fisher type PP test was consistent with the IPS unit root test. The result indicates that ROA whether with trend or without trend was stationary at their levels since the statistic calculated was significant at 1%. Therefore the null hypothesis of the panel containing unit root was rejected.

The GDP also exhibited the same characteristics. However, the till bar statistics for the test without trend was significant at 10%. When trend was included in the model, the result indicated that the variable is stationary at 5%. The test statistic for SIZE was also found to be statistically significant at 1% at their levels. Hence, the study concludes that LabEff is a level variable. Variable that were stationary at their level also included ROE.

Table 5: Regression results

	Pooled OLS		**Return on Asset**		**Return on Equity**	
VAR	ROE	ROA	Random effect	Fixed effect	Fixed	Random
New	0.0310	0.0198	-0.503***	-0.390***	0.0424	-0.139
	(0.0433)	(0.0256)	(0.0719)	(0.0734)	(0.207)	(0.210)
Young	0.0191	-0.00463	-0.116**	-0.0468	0.189	0.0407*
	(0.0275)	(0.0169)	(0.0452)	(0.0460)	0.0424	-0.139
GDP	0.00247*	0.0291***	0.00131***	0.118***	0.140***	0.212***
	(0.00149)	(0.00134)	(0.00250)	(0.00246)	(0.00863)	(0.0091)
BPS	3.70e-08	5.69e-08**	1.335***	1.305***	0.052***	0.088***
	(5.94e-08)	(2.46e-08)	(0.181)	(0.179)	(0.00463)	(0.00484)
LABEff	2.017***	2.291***	7.05e-05	6.06e-05	1.285***	1.172**
	(0.0930)	(0.0674)	(0.000185)	(0.000182)	(0.6005)	(0.2138)
Inflation	-5.21e-05	-0.000112	-0.244***	-0.237***	-1.686	-0.593*
	(0.000109)	(9.95e-05)	(0.0620)	(0.0616)	(1,165)	(0,266)
Credit Union	0.03	0.0493	-1.241***			-1.481*
	(1.0355)	(0.0355)	(0.306)			(0.753)
NBFI	0.0405**	0.0832***	-1.241***			-0.836
	(0.0280)	(0.0280)	(0.233)			(0.878)

NGOs	0.0821**	0.0824**	-1.136***			-4.135**
	(0.0327)	(0.0327)	(0.274)			(1.614)
Rural bank	0.157	0.161	-4.529***			-1.794
	(0.138)	(0.138)	(1.073)			(1.608)
Other	0.0974*	0.0974*	-1.412***			0.334
	(0.0569)	(0.0569)	(0.510)			(0.604)
		(0.0206)	(0.183)		(0.0965)	(0.102)
Size	0.0238**	0.0305***	0.147***	0.155***	0.253***	0.221**
	(0.0151)	(0.0147)	(0.0263)	(0.0258)	(0.0965)	(0.102)
PAR@30	-0.0664***	-0.0722***	-0.197***	-0.210***	-0.354***	-0.25***
	(0.0178)	(0.0166)	(0.0304)	(0.0300)	(0.111)	(0.118)
BANCON	-0.0287*	-0.0312**	-0.270***	-0.0089***	-0.05***	-0.003***
	(0.0168)	(0.0153)	(0.00287)	(0.000283)	(0.00102)	(0.00107)
Constant	0.164***	0.066***	0.867***	0.660***	0.312***	0.603***
	(0.0206)	(0.00513)	(0.419)	(0.0637)	(0.0307)	(0.1213)
Obs	227	227	218	218	218	218
R-squared	0.769	0.873	0.535	.634	0.452	0.552
chi2	9.04**	7.09***	3.56	62.16**	19.54***	84.51**

Hausman			Random effect		Random effect	
			Chi= -18.74		Chi = -706.95	
VIF	1.23	2.03	2.03	2	4.83	3.35

Source: Author's estimate (2015)

*, **, *** denotes 10%, 5% and 1% significance level respectively

Discussion of Results

Macroeconomic variables that had significant effect on microfinance performance is real GDP and Inflation. Real GDP significantly affects microfinance sustainability from a global level perspective. Thus, at the pooled OLS, a one percent increase in a country's real GDP, microfinance institutions in such countries are profitable by 0.217% all other things being equal. Similarly result was found from the model with ROE as the dependent variable from the Pooled OLS models. Thus, as a country's real GDP grows, profitability increases. The study moved on to run fixed effect and random effect models for the study. The results indicates that GDP has a positive effect and statistically significant in both the fixed effect and the random effect models.

After controlling for MFI specific characteristics, the research finds no evidence suggesting a statistically significant relationship between changes in macroeconomic variables (GDP per capita growth and inflation) and profitability of MFIs which is contrary to Ahlin, Lin and Maio (2011) and Liu and Wilson (2010), in the banking sector. Indeed Zaidi, Farooqi, and Naseem (2009), showed that there could be none effect of inflation on MFIs. This may be an indication of the high resilience of MFIs on local macroeconomic conditions. Intuitively, it could also imply that microfinance relies on a poor macro economy to thrive.

The variable, Size (of an MFI) is used to capture economies or diseconomies of scale in the market. Seminal work on modern intermediation theory focusing on the role of financial intermediaries when borrowers and lenders are asymmetrically informed include Diamond (1984), Ramakrishnan and Thakor

(1984), Boyd and Prescott (1986), Williamson (1986) and subsequently Allen (1990). This body of theory predicts economies of scale in the financial intermediation process. If larger MFIs have a greater control of the domestic market, and operate in a non-competitive environment, lending rates may remain high while deposit rates for larger institutions remain lower because they are perceived to be safer. Thus, larger MFIs may enjoy higher profits. This implies therefore that, large size may result in economies of scale that will reduce the cost of gathering and processing information. Institution can contract with a large number of borrowers which results in diversification which could be asymmetry.

From the results, there is a positive relationship between size and profitability of MFIs for all the regression estimates. The larger MFIs are more profitable than smaller MFIs. To be more specific, as the MFIs size increases by one results in an increase in profit by close to 3% in the Pooled OLS model and more than 1% in the fixed effect and random effect models. The positive effects were consistent. The significant result for MFI size across all regressions where the relationship is Linear confirms the economies of scale hypothesis in the microfinance intermediation process. In microfinance literature, these findings confirm Cull and Morduch (2007). It is also consistent with Mersland and Strøm, (2009), Zopounidis and Kosmidou (2008), Athanasoglou et al. (2006) and Beck et al. (2005) but is inconsistent with Sufian and Habibullah (2009), Wu et al. (2007), Pasiouras and Kosmidou (2007), Kosmidou et al. (2006), Bikker and Hu (2002), Demerguç-Kunt and Huizingha (1999) in the banking industry. It can therefore be argued that failure to become profitable in microfinance is partly due to lack of

scale economies. These findings indicate that MFIs may have to institute a dual objective of profit maximisation while presumably pursuing a managerial goal of firm size maximisation. It could also imply that profitable MFIs in Africa have a greater control of the domestic market, and therefore lending rates may remain high while deposit rates remain lower since larger MFIs may be perceived to be safer. This high interest rate spread translates to and sustains higher profits margins.

The evidence from the results confirms Cull and Morduch (2007), and the general literature that performance of MFIs improves with age. Age of the MFI, significantly predicts MFI's profitability. New entrants have a reducing effect on profitability value of about 50.30% compared to matured MFIs. The reason might be that new MFIs are yet to build reputation and also sell themselves to the populace thereby decreasing their outreach compared to matured MFIs that have established. Young MFIs have decreasing outreach percentage of 11.60% compared to older ones. This means that there is time lag between MFI establishment and profitability.

The results in all cases, suggesting that the length of time an MFI has been in operation does not count towards profitability. The theoretical foundation that new entrants into the market are better able to pursue new profit opportunities which translate to higher profits is not supported here. Findings do not confirm Wu et al. (2007) and Beck et al. (2005) who found a negative and significant relationship between age and performance in the banking literature. The research also does not detect significant non-linear effect of age on MFI outcomes, or any reflection of a learning curve on performance.

The main variable of interest, efficiency of labour, was found to be significant in all the models. This finding is consistent with Cull and Morduch (2007) amongst a sample of MFIs and Sufian and Habibullah (2009), Zopounidis and Kosmidou (2008), Athanasoglou, et al. (2008), Pasiouras and Kosmidou (2007), Athanasoglou et al. (2006), Kosmidou, et al. (2006), Guru et al. (2002) in traditional banking. This perhaps reflects problems in large operating expenses and low productivity. Thus, labour efficiency measure used relates to cost. Hence, efficiency should lead to reduction in expenses of the MFI which in turn increases the profit of the MFIs.

As predicted by Miller and Noulas (1996), and subsequently by Brockett et al. (2004), credit risk measured by the sum of the level of loans past due 30 days or more (PAR@30) and still accruing interest is negatively and significantly related to MFI profitability. This study therefore finds evidence to support the conjecture that increased exposure to credit risk is normally associated with lower MFI profitability. This finding is consistent with CSFI (2009) which identified credit risk as the biggest risk faced by the MFIs globally. It also confirms Athanasoglou, et al. (2008), Zopounidis and Kosmidou (2008), and Boubakri et al. (2005) in the banking literature but contrary to Sufian and Habibullah (2009) who observed a positive link between credit risk and profitability.

Comparable evidence amongst the MFIs is scant. Cull et al. (2009) for example examines competition between conventional banks and MFIs and how this impacts on MFIs profitability. They find that the effect of competition on MFI profitability appears weak. Porteous (2006), examines whether microfinance

competition lowers interest rates. McIntosh, Janvry and Sadoulet (2005), examine whether competition affects the incumbent village bank's ability to attract new clients while Park, Brandt and Giles (2003), investigates whether competition affects the effort and lending decisions of the incumbent. The results presented in this study used bank concentration as a measure of bank competition. The result indicates that intense competition in the financial industry by formal banking reduce profitability. However, the result was very weak. This weak results confirms Cull et al. (2011). This negative effect of bank concentration on MFIs profitability may come as a result of lowering interest margins and clients of MFIs. This reduces the profitability of the MFIs as their administrative expenses increase.

Post Estimation test

Table 6: Post Estimation test

	Pooled OLS	**Fixed**	**Random**
Wald test/F test	3.19**	8.9**	26.9*
Hausman test		17.41	18.11*
Omitted variable	0.71		
Serial correlation	0.12	1.27	1.53
Hetero test	1.87	2.22	1.8273

Source: Author's estimate (2015)

*, **, *** denotes 10%, 5% and 1% significance level respectively

The Hausman test for model selection for the variant of random effect and the fixed effect estimated showed that in all cases, the fixed effect was best. The Hausman test for fixed effect was statistically significant at 10% for both models run. For the case of the inclusion of sectoral fixed effect and controlling for the

effect of the 2008 crisis. The Hausman test had a chi square of 17.41 and 18.11 respectively for the fixed effect and random effect. This implies that the fixed effect model is consistent for the estimation done. Also the overall significant of the model was examined using the Wald statistics. For all the estimated models, the Wald test statistics were significant indication that the variables used in the model jointly influence shareholders words. In other words, the variables in the model jointly explain the variation in shareholders wealth as measured by market value added.

The other test conducted for the full model were the omitted variable test for the pooled regression, heteroscedasticity test, serial correlation test. For the pooled regression presented, the models passed the omitted variable test. In other words, there were no omitted variable in the estimated equation. As such, the study concluded that the model is correctly specified. The heteroscedasticity test and serial correlation test as suggested by Wooldridge (2013) and Greene (2012) provides a robust option for the basis of model selection. These tests indicated that, the variance of the estimated models residuals are homoscedastic and serially uncorrelated given credence to the use of the traditional Hausman test used for this study.

Conclusion

The study aimed at examining the trends in profitability and determining factors that influence profitability of MFIs in Africa. The trends of ROE and ROA of MFIs in Africa revealed negative profit levels for MFIs in Africa since 2006 through to 2011. In order to analyse the data, the study used the Fisher type and

IPS panel unit root test to investigate the stationarity of the variables. ROA, ROE and labour efficiency were found to be stationary at levels whereas credit risk, real GDP, inflation, bank competition, size, age and type of an MFI were found to be stationary at first difference. This results were confirmed by the IPS panel unit root test which is more robust relative to the Fisher type. The study went ahead to estimate the regression based on the stationarity of the variables. The study revealed that real GDP, size of an MFI, age of an MFI had a positive and significant effects on profitability of MFIs in all the models estimated. Labour efficiency also had a positive relationship with MFI profits in Africa. Whereas credit risk and inflation were negatively and significantly related to MFI profitability as well as bank competition which reduces profits of MFIs in Africa. The Hausman test conducted approve of the Fixed effect as best model for the study. The post estimation results indicate that residuals were homoscedastic and serially uncorrelated and there were no omitted variables hence, the model was correctly specified.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The chapter presents the summary and conclusions as well as the recommendation of the study. The first section of the chapter presents the summary. Afterwards, conclusions drawn from the study was also presented. Last the recommendations and limitations of the study were presented.

Summary

The study sought to examine the determinants of profitability of MFIs in Africa. To achieve this objective, the main objective was divided into two specific objectives. The first was to examine the trend of profitability of the MFIs in Africa. Secondly, the study examined the factors that determine profitability of MFIs in Africa. Profitability was measured by using Return on Equity (ROE) and Return on assets (ROA).

The study used the MIX Market data for the period 2007 to 2011. This gave a balance panel of an observation of 228. The variables used for the model included the labour efficiency which was measured as the productivity of labour, credit risk as portfolio at risk for 30 days. Other explanatory variables that were used as controls are size of MFI, type of MFI, age of MFIs which are categorical in nature; GDP, Inflation and Bank competition with MFIs. These variables were found to be stationary at first difference using the Fisher's and Im, Pesaran and Shin panel unit root test.

The study employed the fixed effect and random effect as well as pooled

OLS estimation to examine the relationship between the variables of interest. The issue of heteroscedasticity and multicollinearity was not present in the model. Similarly, the models selected for the study was based on the fixed effect which was suggested by the Hausman test for model selection. From the result and discussion;

- It was found that MFIs have recorded negative returns on assets indicating a negative relationship between efficiency and profitability whiles returns on equity have been decreasing steadily and more volatile or outlying. Thus, providing an idea of profitability trends of MFIs in Africa.
- It was observed that labour efficiency had a positive impact on ROA and ROE in all the models. That is, labour efficiency should lead to reduction in expenses of the MFI which in turn increases the profit of the MFIs.
- Credit risk and bank competition from formal banking institutions affect the profitability of MFIs negatively. This means that as the loan defaults increases, the profitability of MFIs reduces.
- It was observed that economic growth has a positive effect on profitability on MFIs while inflation affects MFIs negatively. Thus economic instability of an economy affects the stability and profitability of MFIs in the country. This may imply that higher economic growth means higher economic activity. As this is so, more persons would borrow in anticipation that demand for their production activity would increase. However, higher inflation of an economy means higher uncertainty. This means that cost of loans may increase and deter individuals from acquiring MFI loans and hence credit.

- Also, it was found that size of MFIs affect the profitability in a positive manner, however, the age category was found to have a non-linear effect. Young firms, however, felt better than New MFIs.

Conclusions

First, efficiency in delivering microfinance is an important determinant of profitability and therefore MFIs have much to gain if they improve on their managerial practices. Efficient cost management (such as labour efficiency) is a prerequisite to profitability since this sector may not have reached the maturity level required to link quality effects emanating from increased spending to higher MFI profits.

Secondly, evidence on credit risk is consistent with the research hypothesis. This calls for improvements in information capital. Better screening processes may enable MFIs to mitigate adverse selection problems. Most countries in Africa, however, lack credit reference bureaus or unique identification that would help minimise loan defaults (McIntosh et al., 2005).

Third, the evidence of positive and significant MFI size is an indication that MFIs may have to institute a dual objective of profit maximisation while presumably pursuing a managerial goal of firm size maximisation. It could be the case that MFI with lower repayment and a larger client base is more profitable.

Lastly, other macroeconomic variables and competition are important for the profitability of MFIs in Africa. Thus, economic growth is required for the profitability of MFIs in Africa.

Recommendations

From the conclusions, there is the need to reduce transaction cost to ensure management efficiency. One way to reduce cost could be the use of mobile banking. This is quite feasible given the recent mobile revolution in most African countries.

Measures should also be put in place to help reduce the waste in the system in terms of low efficiency among employees of the MFIs. Motivation measures should be developed to ensure that one member staff could serve as many clients as possible. Since this would go a long way to reduce administrative expenses.

To reduce credit risk, there should be proper screening processes to ensure that the level of potential risk is dealt with. Similarly the need for information sharing among MFIs is long overdue. This could help reduce the risk associated with profitability of MFIs in African countries.

On macroeconomic environment, the government should ensure the enabling environment to ensure the growth and high performing MFIs. This is because the growth of MFIs could help reduce poverty and the access to financial challenges faced by the poor.

Limitation of the Study

The study though conceded of the possible endogeneity in the measures of efficiency and profitability, this study doe not control for endogeneity due to the difficulty in getting appropriate instruments.

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