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Profitability of Microfinance Institutions in Ghana: Does competition matter?

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Abstract

This study investigates the effect of competition on the profitability of Microfinance Institutions (MFIs) in Ghana. We estimate the level of competition at the MFI-level for 58 MFIs nationwide. The study uses a quantitative analytical framework with unbalanced panel data covering the period 2000-2014. We adopted the generalised method of moments estimator proposed by Blundell and Bond (1998) in estimating the results. The main finding indicates that competition impacts negatively on MFIs profitability in Ghana. Also, our results suggest that size,capitalisation, debt to equity ratio, outreach (in depth and breadth) and inflation are significant determinants of MFIs profitability in Ghana.

Keywords: *Microfinance Institutions; Profitability; Competition; Lerner Index; Ghana.*

JEL Classification: *G21, L10, L25*

1. Introduction

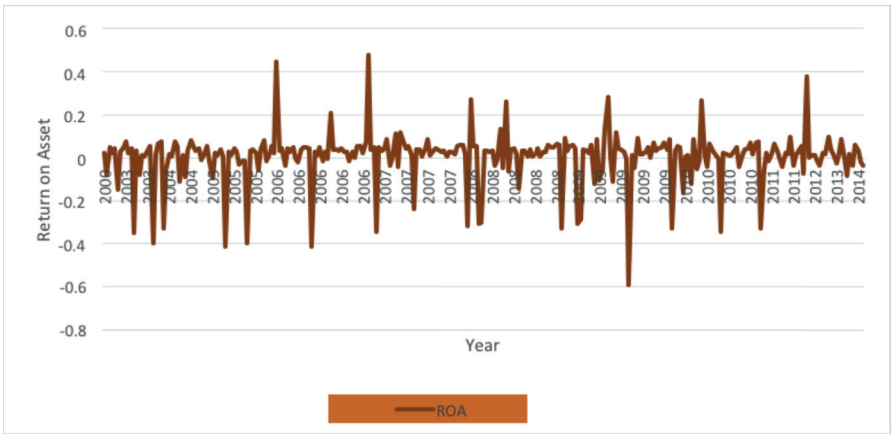
Microfinance was pioneered by the cutting-edge work of Muhammed Yunus, who is considered as the father of microfinance in Bangladesh in the early 1970s. His work later attracted the attention of most of the developing world. According to the Consultative Group to Assist the Poor (CGAP, 1996), microfinance is defined as "a facility that offers poor people access to basic financial services such as loans, savings, money transfer services and micro-insurance" (www.cgap.org). The main essence of microlending is the provision of financial intermediation specifically in the form of microcredit to SMEs, which form part of the major economic activities of the low-income people (Yunus, 2007; Fauster, 2014). The issue of microfinance has gained attention among both academics and policy-makers as an effective poverty alleviating tool of the un-banked population through the delivery of financial credit (Sekabira, 2013; Fauster, 2014). The lack of collateral security limits the borrowing capacity of low-income people in most developing countries. This group of people are largely in the informal sector. They depend on moneylenders where they obtain microcredit at usurious rates or are sometimes deprived of the facility and thus business opportunities which affect employment opportunities (Quaye & Hartarska, 2016).

For Yunus, microfinance should be a "social business" for which donor support will make the poor and very poor customers bankable. However, Yunus and Jolis (2003) argue that access to finance is more essential than the interest rate. Indeed, Cull, Demirgüç-Kunt and Morduch (2009) assert that small loans are costly to administer and that the low-income group can pay high-interest rates.

In eliminating financial limitations, MFIs can raise small scale businesses from unserved market activities and also make a return on their investments. There have been various levels of achievements or performance across MFIs in terms of sustainability and efficiency depending on several factors. Whilst some failed, others have expanded to serve a lot of clients. It is however, unclear as to how the profitability of MFIs will be impacted as competition in the sector intensifies. This question has become a matter of concern given the emergence of microfinance as a poverty alleviating tool over the past decades in both developed and developing economies (Henry, 2000).

While the subject of efficiency and sustainability have been extensively investigated in the microfinance literature (Kinde, 2012; Tehulu, 2013; Gebremichael & Gessesse, 2016; Fonchamnyo, Wiysanyuy & Assi, 2017) very few studies are related to how competition affects MFIs' profitability. Even so, these studies are either cross-country and/or in other advanced jurisdictions of dissimilar economies (Claessens & Laeven, 2004; Delis, 2012; Assefa, Hermes & Meesters, 2013).

Figure 1: Performance of MFIs over time



The few studies that have assessed the effect of competition on MFI performance have had mixed findings. Some studies have concluded on positive relationship between competition and MFIs performance (Gwasi & Ngambi, 2014; Uddin & Suzuki, 2014), while others pointed out to negative associations (Tehulu, 2013; Assefa *et al.*, 2013). On one hand, it is indicated that competition may lead to lowering the cost of production, prices of goods and services and development of new products (Motta, 2004). In another perspective, others argue that competition might have negative effects, as it leads to lower borrower selection standards, multiple loan-taking and thus high defaults among clients (see Mcintosh & Wydick, 2005; Assefa *et al*., 2013).

Despite these studies in the area of performance of microfinance institutions, this study to the best of our knowledge is the first to investigate the impact of competition on profitability in the Ghanaian context. The microfinance sector witnessed proliferation of MFIs and other enterprises between 2000 to 2010 that called themselves financial services providers. In addition, some commercial banks scaled down their operations to microfinance business and other large investments were also made in the industry, suggesting the lucrativeness of microfinance business in Ghana (GHAMFIN, 2014). According to the World Bank (2016), the proliferation of new types of unregulated microfinance service providers in Ghana disrupted the system, with increasing cases of fraud, insolvency, and loss of savings by poor households. Thus, the heightened competitive landscape that resulted, came along with questions about the profitability and sustainability of MFIs. In fact, as indicated in Figure 1, the general profit profile of MFIs in Ghana over the past decade or so has been quite abysmal, with only few periods of positive returns.

Anaman and Pobbi (2019) analysed the performance and sustainability of MFIs in Ghana, but they did not directly assess the effect of competition. Their study revealed

that loan default and interest expenses negatively affect the performance of MFIs. Indeed, a major reason for the collapse of many MFIs in Ghana in recent years is the high rate of interest paid on deposits to attract customers (Bank of Ghana, 2019). As argued by Hossain, Galbreath, Monzur and Randøy (2020), competition has an adverse impact on the operating cost and margin of MFIs, thereby undermining their financial sustainability. This motivates us to investigate whether increased competition has had a negative effect on the profitability of MFIs in Ghana.

The purpose of this article is to examine the relationship between competition and profitability of MFIs in Ghana. The study addresses the question: whether competition matters in the profitability of MFIs in Ghana?

The rest of this paper is organised as follows: the next section outlines the stylized facts of microfinance in Ghana. Following that is the literature review of the study. The next section presents the methodology with consideration to measuring competition, the data and the analytical framework used in analysing the data. The penultimate section presents and discusses the results of our empirical investigation. Finally, the last section summarizes the findings of the study and also concludes the discussion with policy recommendations.

1.1. Stylized Facts of Microfinance Institutions in Ghana

The concept of microfinance is not a novel phenomenon in Ghana and dates back to the colonial era. The tradition of saving and/or taking microcredit from friends and groups to support or start a business or farming activities began early in the colonial era. Asiama and Osei (2007) stated that the first credit union in Africa was established in Northern Ghana in 1955 by Canadian catholic missionaries. Susu which is a microfinance scheme is believed to have originated from Nigeria and extended to Ghana in the early twentieth century.

Over the years, the microfinance sector has emerged and developed into a well-organised and nationally coordinated commercial sector in the country notwithstanding the several impediments it has faced. This has been made possible by the various financial sector policies and programmes undertaken by different governments since independence (Gallardo, Ouattara, Randhawa & Steel, 2005). Some of these policies include the establishment of the Agricultural Development Bank (ADB) in 1965 purposely to address the financial needs of the fisheries and agricultural sector, provision of subsidized microcredit in the 1950s and commercial banks being required to put aside 20% of the total deposits to promote lending to small scale industries and agriculture in the early 1980s (Andah & Steel, 2003). Some challenges that the microfinance sector has faced for sometime now include information asymmetry, high-interest rate, and inadequate access to credit from commercial banks (Quaye & Hartarska, 2016). To promote the microfinance business

in Ghana, the government at the time passed the PNDC Law 328 in 1991. This was to allow the establishment of various categories of non-bank financial institutions consisting of:

- Formal suppliers such as savings and loans companies, Rural and Community Banks (RCBs) and other commercial banks.
- Semi-formal suppliers such as credit unions, financial non-governmental organisations (FNGOs) and cooperative societies.
- Informal suppliers such as Susu collectors and clubs, rotating and accumulating savings and credit associations, moneylenders, among many others. Bank of Ghana, which serves as the central bank of the country regulates the operations of MFIs in Ghana.

The current legal framework has categorised MFIs into deposit-taking in Tier 1 consisting of Rural and Community Banks and Savings and Loans Companies. Deposit-taking institutions in Tier 2 include Credit Unions. Non-deposit-taking in Tier 3 includes Financial Non-governmental Organisations and Money Lending Companies while Tier 4 is reserved for individuals engaged in only lending (Moneylenders) or savings (Susu collectors) (Quaye & Hartarska, 2016).

The government realised that the general policy framework for microfinance is informed by the poverty reduction approach, which seeks to stabilise growth and macroeconomic stability with human development and empowerment in a way to positively influence the alleviation of the country's poverty levels in the medium term (Government of Ghana, 2005).

As of December 2013, the microfinance sub-sector had about one thousand, six hundred and twenty- eight (1,628) firms consisting of all categories of MFIs. Among these, about ninety (90) institutions were registered with the Ghana Microfinance Institutions Network (GHAMFIN) and served over 500,000 clients across the country. However, in 2015, Bank of Ghana published a list of some 130 MFIs operating illegally without having obtained a license, and revoked licenses of 70 in 2016. In fact, between 2012 and 2016, there were closures (actual or mandated) on the order of 100 a year (World Bank, 2016). Besides, in 2019 a total of 347 microfinance companies had their licences revoked, comprising 155 insolvent institutions that had already ceased operations, and 192 other insolvent ones. In addition, the licences of 39 microcredit companies (also known as money lenders) were revoked, comprising 10 of such companies that were insolvent and had ceased operations, as well as 29 other insolvent ones (Bank of Ghana, 2019). Hence, as at the end of 2019, just about 800 MFIs remained in operation. This was bad news for the microfinance sector. However, it was to make the sector more robust and safeguard depositors' funds.

It is widely known that loans advanced by MFIs are usually for petty trading, housing and start-up loans for farmers to purchase inputs and for establishing

businesses. These loans are sometimes advanced to groups of borrowers for collective enterprises such as cooperative farming, irrigation works among others. The trend of loans and advances to small businesses, groups and individuals by Non-Bank Deposit-taking Institutions (NBDIs) in Ghana amounted to Ghs 50.97 million in 2002 as against Ghs 39.64 million in 2001 representing about 28.6% growth. It further increased to Ghs 70.63 million, Ghs 72.85 million, and Ghs 160.47 million for 2003, 2004 and 2006 respectively. Rural and Community banks also contribute significantly to the growth of the sector. Total advances made by all RCBs in Ghana stood at Ghs 20.68 million in 2002 as compared to Ghs 13.12 million in 2001 indicating an increase of 28.6%. This increased further to Ghs 71.63 million and Ghs 115.10 million in 2005 and 2006 respectively. Consequently, the number of clients MFIs have reached increased tremendously over the years. The total number of clients increased to 1.3 million, 3.5 million, 5.5 million in 2001, 2006 and 2010 respectively. It further increased to about 8 million in 2013 representing 45% growth of client base. Microfinance has been extended to a wide range of market niches in Ghana, from rural small enterprise owners to urban small enterprise owners (Asiama & Osei, 2007).

Despite the numerous prospects and the largely unserved market for MFIs, the microfinance sub-sector is still faced with lots of challenges. Andah (2008) underscored constant vicissitude in government policies, huge operational cost, diversion of funds, inadequate finance, a large amount of non-performing loans, low capacity and inadequate technical know-how in the sector as obstacles to the performance of this sub-sector. These challenges, many of which contributed to the failure of previous schemes still threaten the MFI schemes in Ghana. Another crucial challenge not uncommon in the literature as an impediment to the growth of the sub-sector in Ghana is inadequate funds to support institutional and human capacity building. Particularly, the scarcity of human capacity in the microfinance industry in Ghana has been a long-standing issue since the days of RCBs (Asiama & Osei, 2007; Boateng, 2015).

2. Literature Review

The theory of competition opines that, rival firms attempt to gain the market by establishing superiority over others in the same industry. In the microfinance industry, MFIs compete for market share as each strives to win the market at the expense of its rivals. Nutter and Moore (1976) explain that if two firms are in the market, their competition will induce both of them to price their products cheaper than if it was in a monopoly situation; and if many firms are involved, their competition will be much greater, and the chance of collusion to raise the price of the product will be limited. The theory advocates that firms that could withstand competition will have more market power and thus profitable. If competition increases, the profit of MFIs will reduce as many MFIs cannot afford to price their products above the marginal cost.

The Structure-Conduct-Performance (SCP) hypothesis, which is frequently employed in the banking literature postulates that concentration within the industry leads to possible market power by financial institutions, which might increase their profitability (Uddin & Suzuki, 2014). The SCP hypothesis states that the direction of causality run from market structure to behaviour, and then performance. Financial institutions in highly concentrated markets are more likely to earn economic profits because of their capability to decrease and increase the interest rate on deposits and loans respectively, above the marginal cost as a result of collusion, than institutions operating in less concentrated markets, irrespective of their productivity (Dietrich & Wanzenried, 2011). Staikouras and Wood (2004) showed a statistically insignificant but negative relationship between bank concentration ratio and the profitability of banks. From the above-mentioned theories, however, we can infer that the profitability of MFIs depend on the market concentration and management efficiency of MFIs. Thus, it is uncommon to find many firms being profitable in a low market concentration environment as the microfinance business becomes very competitive.

Studies on MFIs' performance tend to focus on efficiency and sustainability rather than profitability. Previous research in the area of efficiency includes Hermes, Lensink and Meesters (2011); Nashihin and Harahap (2014); Abdulai and Tewari (2016); and Gebremichael and Gessesse (2016). Other studies in the area of sustainability of microfinance are, Bogan, Johnson and Mhlanga (2007); Kimando, Kihoro and Njogu (2012); Kinde (2012); Tehulu (2013); Gashayie and Singh (2014); Gashayie and Singh (2015); Nurmakhanova, Kretzschmar and Fedhila (2015); Long (2015); Wafula, Mutua and Musiega (2017) among others.

Dietrich and Wanzenried (2011) found a significant and positive association between competition and profitability of banks in Switzerland. Gwasi and Ngambi (2014) investigated the performance of 25 MFIs in Cameroon from 2007 to 2011. The study employed panel data and ordinary least square (OLS) models and found a positive but statistically not different from zero association between competition and profitability of MFIs. Contrary to the studies above, McIntosh, Janvry and Sadoulet (2005) found that intense competition resulted in numerous loan-taking and as a result it reduced loan repayment. Although their study did not directly investigate the effect of competition on MFIs' profitability, their study indirectly found a negative impact of intense competition on repayment performance that is consistent with Mcintosh and Wydick (2005) findings.

Similarly, Mersland and Strøm (2009) found a negative association between competition and profitability. Assefa *et al.* (2013) also found that increase in competition was associated with a low level of loan repayment which led to poor portfolio quality and eventually affected the profitability of MFIs. Thus, increase in competition has a negative relationship with profitability, as profit is being competed

for by new firms. Besides the effect of competition, other factors have been identified in the literature as part of the determinants of profitability. For instance, Muriu (2011) analysed the determinants of profitability of MFIs in Africa and found that size is statistically significant at 1% and positively related to profitability. Similarly, Lislevand (2012) examined the impact of capital structure on performance of MFIs using cross-sectional data of 403 MFIs in 73 countries. The study used OLS regression techniques and found that firm size is significant and positively related to profitability. Saeed (2014) investigated the performance of banks in the United Kingdom and found that size positively affected the profitability of banks. It underscored the idea that large banks benefited from cost reduction, and economies of scale and is expected to have a large amount of production than the smaller ones (Goddard, Molyneux, & Wilson, 2004). Other studies that found supporting empirical evidence include Dietrich and Wanzenried (2011), Cull, Demirgur-Kunt and Morduch (2007).

According to Muriu (2011), a study on what determines the profitability of MFIs using a panel data set of 210 MFIs depicted that capital asset ratio had a strong and momentous positive relationship with MFIs' profitability. Inherently, it indicated that better stable MFIs are in a good position to manage the challenges that arise from unforeseen contingencies, and are faced with a low cost of financing or reduced outside financing. Similarly, Fersi and Boujelbéne (2016) examined the determinants of performance of 333 conventional and 49 Islamic MFIs for the period of 1996 to 2012 for six different regions. The study used a simple linear regression and found a significant and positive relationship between capital asset ratio and profitability. Using fixed effect regression models, Pati (2015) also investigated 40 MFIs in India from 2009 to 2013 and found that capital asset ratio was significantly and positively related with profitability.

Fersi and Boujelbéne (2016) found a significant and positive association between debt to equity ratio and profitability for both conventional and Islamic MFIs. Uwalomwa and Uadiale (2012) used 31 listed firms on the Nigerian Stock Exchange from 2005 to 2009 and found that short term debt had a significant positive impact on firms' performance indicating that short term debt seems to be less expensive and thus enhanced firms' performance. On the contrary, the study found that long term debt had a significant negative effect on the performance of firms suggesting that long term debt is more expensive as a result of certain explicit and implicit expenses associated with it.

Tehulu (2013) also investigated the impact of capital structure on firm performance of 23 MFIs in East Africa from 2004 to 2009 using binary and ordered probit regression models. The study found that loan intensity and size are statistically significant and positively related to MFIs performance. Muriu (2011) also found that, firms that employed a large amount of debt in their capital mix are more successful.

Using a probit model on panel data of 14 Ugandan MFIs, Sekabira (2013) investigated the capital structure of firms and found that total debt on equity is significant and negatively related to the profitability of MFIs in Uganda. Muriu (2011) found that portfolio at risk is statistically significant and negatively related to MFIs profitability. Similarly, Campbell and Rogers (2012) provided evidence for a negative relationship between MFIs' profitability and portfolio at risk (PAR) greater than 30 days, using cross-sectional data. The results suggested that as more of MFIs' portfolio become risky, profits of MFIs declined. However, Fersi and Boujelbéne (2016) found that PAR is positively related to MFIs profitability. This is in line with the risk-return hypothesis that highly risky portfolios lead to greater returns for MFIs. Empirical evidence indicates that institutions that offer smaller loans are equally profitable as compared to institutions granting bigger loans (Cull *et al*., 2007). Ayayi and Sene (2010) found average loan size per borrower to be robustly statistically different from zero and positively associated with MFIs' performance. Similarly, Kinde (2012) examined the financial sustainability of 16 MFIs in Ethiopia from 2002 to 2010. The study estimated the regression using the random-effect model on a panel data of 144 observations from the Nation Bank of Ethiopia and the MIX market database. The study found the average loan size to be statistically significant at 5% and positively related to the financial performance of MFIs in Ethiopia. On the contrary, Quayes (2012) found that there is a negative relationship between average loan size and MFIs performance.

Rahman and Mazlan (2014) found the number of active borrowers to be statistically significant and negatively related to the profitability of MFIs. Again, Quayes (2012) investigated the financial sustainability of 702 MFIs in 83 countries using cross-sectional data from the MIX market database. The study used a logit model in estimating the regression results and found that there is a negative relationship between the number of active borrowers and MFIs performance. Hermes *et al*. (2011) also showed that the number of active borrowers is robustly significant and negatively related to MFIs' performance.

Gwasi and Ngambi (2014) found a positive and insignificant association between GDP and MFIs profitability. This showed that GDP does not have any significant impact on the variability of ROA (profitability). This lack of evidence could mean that the success of MFIs is independent of the movement of macroeconomics variables of the country. Financing MFIs could be an alternative diversification opportunity as the industry might be somewhat disconnected from the normal economy. Also, Ashenafi and Kingawa (2018) examined the internal and external factors that affected the profitability of MFIs in Ethiopia spanning from 2009-2013. The study employed a linear regression model and found that GDP is statistically insignificant and positively related to profitability. Gwasi and Ngambi (2014) found

a negative and insignificant association between inflation and MFIs' profitability. This suggests that inflation does not have any significant impact on the variation in ROA (profitability). Another study that found similar results is Amidu and Wolfe (2013). On the contrary, other studies have found a positive relationship including Athanasoglou et al. (2008), Krakah and Ameyaw (2010) and Delis (2012).

In line with the discussion in the literature, the study proposed the following hypotheses:

H1. There is a negative relationship between competition and profitability.

H2. There is a positive relationship between size and MFI profitability.

H3. There is a positive relationship between capital ratio, debt ratio and MFI profitability.

H4: There is a negative relationship between credit risk and profitability.

H5: There is a positive relationship between the average loan size, number of active borrowers and MFI profitability.

H6: There is a significant positive relationship between GDP per capita and profitability.

H7: There is a significant negative relationship between inflation and MFI profitability.

3. Methodology

3.1. Data

The most credible source of microfinance data is the MIX market database, which reports published financial statements from MFIs across the globe. Out of 58 MFIs that were included in the paper, 2 of them are credit unions and cooperatives (CU), 11 are Non-Bank Financial institutions (NBFI), 16 are Non-Governmental Organisations (NGOs) and 29 are Rural Community Banks (RCBs). The data has been formalised into a common format to enable comparison across firms and thus appropriate for firm-level study as well as country level study. Financial statements of MFIs accessible for 15 years from 2000 to 2014 were used. These financial statements were obtained from the MIX market database (www.mixmarket.org). The data is available to the public through the World Bank Research Department.

The MIX market database uses a diamond system which shows the availability and quality of the data obtained from MFIs. MFIs with high levels of diamonds signify a high level of financial reports and quality of data. Three diamonds stand for MFIs reporting for two or more successive years with regard to outreach, general information and financial data. Four diamonds reflect data as with three diamonds but includes audited financial statements, whilst five diamonds indicate data as with four diamonds in addition to rating and other benchmarking evaluations. The

study used data from firms with three diamonds and above. Variables extracted from the financial statements of MFIs include some of those listed in Table 1. An important strength of the dataset is that the figures are adjusted to show the roles of both implicit and explicit subsidies and to a large extent bring them into conformity with international accounting standards. The strength of our sample is that the MFIs were selected largely based on their ability to deliver quality data. One disadvantage of the dataset is that participation in the database is voluntary. Recently, working in collaboration with Ghana Microfinance Institutions Network (GHAMFIN), Association of Rural Banks (ARB), Association of Non-Governmental Organisations (ASSFIN), Credit Union Association of Ghana (CUA) and Ghana Co-operative Susu Collectors Association (GCSCA), about thirty-three of these institutions submitted their microloan product information and pricing data to a national private US-based non-profit organisation known as the Microfinance Transparency (MFT) to enhance transparency and client protection through the Transparent Pricing Initiative in Ghana (Quaye & Hartarska, 2016).

We also obtained macroeconomics data, such as GDP per capita growth rate and inflation rate from the World Development Indicators (WDI) produced by the World Bank Research Department. All the data were reported in US dollars and expressed at constant prices where necessary.

Table 1: Description of Variables and Data Sources

Variable	Description	A priori sign	Source
ROA (Return on assets)	Net annual income/total assets		MIX Market
Lerner Index	Output price minus marginal cost marked up by output price	Negative	Own calculation
LnSize	Natural log of the total of all net assets	Positive	MIX Market
Capital ratio	Shareholder's Equity/total assets	Positive	Own calculation
Debt to equity (DER)	Debt/Shareholder's Equity	Positive	MIX Market
Credit Risk (CRSK)	The ratio of the portfolio at risk >30 days to gross loan portfolio	Negative	MIX Market
LnAVL	Natural log of average loan balance per borrower in USD	Positive	MIX Market
LnNAB	Natural log of number of active borrowers who currently have an outstanding loan balance or are mainly accountable for repaying any fraction of the loan portfolio	Positive	MIX Market
GDPP	Real GDP to the total population growth rate	Positive	WDI
Inflation	Inflation rate (CPI)	Negative	WDI

Source: *Authors' Compilation (2020)*

3.2. Description of Variables

Return on Assets (ROA)

Three major measures that are commonly employed in assessing profitability of financial institutions are Return on Assets (ROA), Return on Equity (ROE) and Net Interest Margin (NIM) (Dietrich & Wanzried, 2011; Sekabira, 2013). This paper used ROA as a proxy for profitability because it gives a better measure of firm performance as it considers the returns on all the assets, risk taking and management of the firm. ROA also indicates the per unit profit gained by assets and reflects management capability to use banks' financial and real investment resources to generate profit (Hassan & Bashir, 2003). Return on assets is described as the proportion of net earnings to total assets. ROA portrays a general view or impression of how effectively or well management is managing the firms' assets to make income.

Rivard and Thomas (1997) argued that bank profit is most appropriately measured by ROA because it is not slanted by higher equity multipliers. As indicated in the appendix, return on equity was higher than return on asset which could be attributed to equity multipliers. Unlike the ROE, the ROA determines the profitability irrespective of the underlying funding structure of the institution, and allows for comparison between profit and non-profit MFIs (Fersi & Boujelbéne, 2016). According to Muriu (2011), ROA is a more comprehensive measure of profitability, allows for comparison with previous studies and is also widely used in both banking and microfinance literature. However, results using ROE are presented in the Appendix.

The Lerner Index

The Lerner index is our measure of MFI-level of competition. The index ranges between 0 and 1 which has an inverse interpretation. Higher index imply lower competition among firms and vice versa. Structure–Conduct–Performance (SCP) hypothesis advocates that higher concentration in the banking industry has a positive impact on bank profitability, since collusion among financial institutions may lead to higher interest on loans and lower return interest on deposits (Uddin & Suzuki, 2014).

Capitalisation: The equity-to-asset ratio is one of many essential financial ratios used to evaluate the financial strength and the future profitability of a firm. It is often used by investors to determine whether the firms' shares are in a safe investment. This represents the total current value of the money invested in the business by all shareholders (Pasiouras, 2008).

Size of Microfinance: The size of an MFI is proxied by the worth of its total assets (Hermes *et al*., 2009). A study by Short (1979) pointed out that size and capital adequacy of a bank are closely related as bigger banks are in a good position to obtain cheaper capital and tend to be more productive than smaller ones. In our

analysis, we take the natural log of size and expect it to be positively related to profitability as assets of a firm increases with output.

Debt ratio: The proportion of debt to equity is estimated as the ratio of liability to total equity. The overall debt consists of total indebtedness to customers or organisations, comprising of clients' credits, loans, accounts payable and other obligation accounts. The leverage ratio is a well-known measurement of capital sufficiency in that it estimates the total leverage of the MFIs (Yenesew, 2014). The risk-return hypothesis postulates that more debt financing does reward higher returns while signalling and bankruptcy hypotheses suggest that high equity ratio leads to high profitability as a result of signalling effect and lower financial cost.

Credit risk: Portfolio specifies the aggregate income that is available for the MFIs to grant in the form of credit to their customers. Portfolio quality refers to the organisation's ability to safeguard its portfolio from all forms of uncertainty. The credit portfolio is by far MFIs' biggest asset and besides, the value of that asset and thus, the risk it has for the organisation can be fairly challenging to measure (Nelson, 2011). It is measured as the ratio of the portfolio at risk >30 days to gross loan portfolio.

Average loan size: The average loan size is measured as the natural log of average loan balance per borrower in USD. Studies argue that smaller loans are costly to administer and thus dealing with the poor and women will affect the profitability of MFIs (Yunus & Jolis, 2003; Cull *et al*., 2009).

Number of active borrowers: Number of active borrowers is the number of borrowers who currently have an outstanding loan balance or are mainly accountable for repayment of any portion of the loan portfolio. Rahman and Mazlan (2014) investigated the determinants of operational efficiency of five MFIs in Bangladesh using panel data from MIXmarket spanning through 2005 to 2011. The study used a multiple linear regression and found that average loan size per borrower is insignificant and negatively related to MFIs performance in Bangladesh.

GDPP: The GDP per capita of a country determines the wellbeing of the citizens and thus also affects the outlook of the economy particularly the performance of MFIs. In the period of high real GDP per capita growth rate, the profit of MFIs will increase because lending by these firms will be high leading to wider interest margin. MFIs can access money market funds at a cheaper cost and demand for credit and stock market transactions will be considerably improved, hence higher profits for firms (Athanasoglou *et al*., 2008).

Inflation: High inflation limits debtors and creditors ability to interact with one another although the effect on lending by microfinance institutions is somewhat subdued. In the period of high inflation, the cost of borrowing is high and that may

affect loan repayment and thus the general performance of MFIs, while the opposite might hold for low inflation (see Ahlin & Lin, 2006; Gwasi & Ngambi, 2014).

3.3. Empirical Approach and Estimation Techniques

The essence of using panel data is because of more observations that take time and cross-sectional dimensions. It also enabled us to control for correlation amid unobserved individual-specific effects. To examine the relationship between competition and profitability of MFIs in Ghana, we estimate a linear regression model of the form:

$$y_{it} = \alpha_t + \beta_{it} X_{it} + \varepsilon_{it} \quad (1)$$

Where i refers to an individual MFI; t refers to year; y_{it} refers to the profitability of MFI i at time t. X_{it} represents determinants of profitability in the model; ε_{it} is the normally distributed random variable disturbance term.

To assess the relationship between competition and profitability, the paper employs the dynamic panel model specified in equation (2). Our econometric specification is similar to Agbloyor *et al*. (2016) and Hermes *et al.* (2009).

$$\begin{aligned} \mathrm{Prof}_{it} = {} & \beta_1 \mathrm{Prof}_{i,t-1} + \beta_2 \mathrm{LI}_{it} + \beta_3 \mathrm{lnSize}_{it} + \beta_4 \mathrm{Cap}_{it} + \beta_5 \mathrm{DER}_{it} + \beta_6 \mathrm{CRSK}_{it} + \beta_7 \mathrm{LnAVL}_{it} \\ & + \beta_8 \mathrm{LnNAB}_{it} + \beta_9 \mathrm{GDPP}_t + \beta_{10} \mathrm{INFL}_t + \mathrm{e}_{it} \end{aligned} \quad (2)$$

In this specification, Prof means profitability which is proxied with Return on Asset (ROA) for MFI i in the year t. $\mathrm{Prof}_{i,t-1}$ stands for the lag of ROA, LI is Lerner Index of MFI i at year t, LnSize is MFI size proxied with the natural log of total assets. Also, Cap stands for capitalisation measured as equity to total asset ratio, and DER is proxied with debt to equity ratio. The dataset lacks a direct measure of outreach to the poor. The study uses the natural log of average loan size per borrower (LnAVL) as a measure of the depth of outreach. LnNAB stands for natural log of the number of active borrowers, which also measures the breadth of outreach. GDPP represents GDP per capita growth rate, INFL stands for inflation rate and $e_{it} = u_i + \varepsilon_{it}$ is the disturbance term with u_i as the MFI-specific effect and ε_{it} as idiosyncratic error term that varies across time and entities.

One of the major aims of microfinance institutions has to do with offering financial services to the un-bankable populace. For this reason, the paper includes the two most frequently used measures of the outreach of MFIs (Assefa *et al*., 2013; Cull, Demirgüç-Kunt, & Morduch, 2009 and Hermes *et al*., 2009). Firstly, the paper assessed the depth of outreach by a proxy of average loan size per borrower (LnAVL) and proxied the breadth of outreach with natural log of the number of active borrowers (LnNAB).

The study includes MFI-specific explanatory variables of interest such as the size of the firm. With regard to how well management is using shareholders' resources, we included in our analysis debt to equity (DER) which determines how much debt

management is employing to manage the business. The study considered portfolio at risk that is 30 days overdue as a proxy for credit risk or to capture the differences in risk-taking behaviour of MFIs. The paper also included some macroeconomic variables. For instance, GDP per capita growth rate and inflation rate (INFL) take care of the economic environment.

A popular metric for competition employed in the banking literature is the Lerner index (Assefa *et al*., 2013; Amidu & Wolfe, 2013; Berger, Klapper & Turk-Ariss, 2009). It measures firm-level competition and varies over time, thus more preferable to the Panzar-Rosse (PR) and Herfindahl-Hirschman Index (HHI) approaches. However, to ensure consistency of our results we use the HHI for robustness check. The PR approach is an empirical method that determines the impact of variances in factor input prices at firm-level incomes and applies cross-sectional data to evaluate competitive behaviour (Bikker & Haaf, 2002). Koetter, Kolari, and Spierdijk (2012) argued that the PR approach of estimating competition is time-invariant and thus inappropriate in its application particularly for panel data.

The Lerner index measures competition by investigating the variance between the output price and the marginal cost of production at the firm level. Similar to Assefa *et al.* (2013) and Amidu and Wolfe (2013), this paper measures MFIs competition using the Lerner index defined as:

$$L_{it} = \frac{P_{it} - MC_{it}}{P_{it}} \tag{3}$$

Where P_{it} is the output price of firm i at time t, proxied by the yield on the gross loan portfolio, and MC_{it} is the marginal cost of producing an additional output of a firm at time t. The Lerner index is the mark-up of price over marginal costs, with a higher index signifying greater market power and hence less competitive market conditions. In particular, it indicates the degree to which a particular MFI has the market power to price its products over the marginal cost. The Lerner index is capable of determining firm-level competition using panel data, unlike the PR which is appropriate for cross-sectional data. This gave us the advantage to use the Lerner index, as our data obtained is a panel data. In estimating the cost structure of the microfinance industry, the paper applies the translogarithmic function which is common in the banking literature.

$$\begin{aligned} \ln TC_{it} \quad = \quad & \beta_0 + \beta_1 \ln y_{it} + \frac{\beta_2}{2}(\ln y)^2_{it} + \sum_{k=1}^{2} \gamma_k \ln w_{k,it} \\ & + \frac{1}{2}\sum_{i=1}^{2} \phi_k \ln y_{it} \ln w_{k,it} + \sum_{k=1}^{2}\sum_{j=1}^{2} \theta \ln w_{k,it} \ln w_{j,it} + \sum_{i=1}^{2} \frac{\varphi}{2}(\ln w)^2_{j,it} \\ & + \wp \text{trend} + \frac{1}{2}\beta_2 \text{trend}^2 + \sum_{i=1}^{2} \zeta_i \ln w_{j,it} \text{trend} + \delta \ln y_{it} \text{trend} + \text{CRSK}_{it} + \varepsilon_{it} \end{aligned} \tag{4}$$

Where $\ln TC_{it}$ captures the total cost of production (financial and operating expenses) of MFI i at time t. The independent variable y_{it} captures the output of MFI i at time t which is proxied with gross loan portfolio. lnW stands for various input prices of MFI i at time t. The paper took the natural log of all the variables except trend and portfolio at risk greater than 30 days (credit risk). In estimating the cost of MFI, this paper considers two inputs which are very essential for MFIs. They are labour cost (W_1) and the cost of capital (W_2). To calculate the cost of labour the study took the ratio of operating expenses to the number of employees with the assumption that the major component of operational costs is the personnel salaries. The ratio of financial expenditure to total liabilities is employed as a proxy for the cost of capital.

Importantly, the cost function contains a time trend variable to take care of technological change or the movement of the cost function over time and MFI-specific fixed effects. This is to cater for related variances in the cost structures among MFIs and unobserved MFI heterogeneity. Lastly, the paper included a portfolio at risk greater than 30 days (credit risk) which is to capture the differences in risk-taking behaviour of MFIs. The paper uses the pooled OLS regression to estimate the translog cost function to obtain the coefficients necessary for estimating the marginal cost. The marginal cost, MC_{it} is obtained from the translogarithmic total cost function by taking the first derivative with respect to output which is proxied with gross loan portfolio as shown below.

$$MC_{it} = \frac{TC_{it}}{y_{it}}\left[\beta_1 + \beta_2 \ln y_{it} + \sum_{k=1}^{2} \phi_k \ln w_{k,it} + \delta trend_{it}\right] \quad (5)$$

After estimating equation (5), the paper computes the Lerner index in equation (3) to determine the level of competition in the microfinance industry in Ghana.

Blundell and Bond (1998) proposed the system GMM estimator that utilised the moment conditions in which lagged differences are used as instruments for the level equation in addition to the moment conditions of lagged levels as instruments for the differenced equation (Roodman, 2006). The system GMM requires that panel-level effects be uncorrelated with the first difference of the first observation of the dependent variable. The estimator is designed to handle datasets that have few periods and many panels. One of the assumptions of the system GMM is that there is no autocorrelation among the error terms. This is in line with the assumption that the disturbance terms in a Classical Linear Regression Model (CLRM) should be linearly independent of one another i.e cov (u_i, u_j) = 0 (Chris, 2008).

Also, one advantage the system GMM estimator has over the traditional GMM estimator is that it caters for some concerns, for instance, where the autoregressive parameter is large and the number of time series is less than the number of observations.

The reason for the adoption of system GMM as a model of evaluation technique rather than fixed effects, random effects, or OLS models for this paper stems from the fact that the introduction of the lagged dependent variable tends to create an autocorrelation in the model. System GMM has a property that takes care of autocorrelation by using the past levels of the first differenced lagged dependent variable as an instrument. This is also to help remove unobserved heterogeneity. Again, the data has a large number of cross-sectional units (58 MFIs) and a relatively smaller number of time observations (15 years). With such data, the system GMM is preferred. Given the number of periods and the dynamic nature of the specification of the model, the static models will create a Nickel bias and inappropriate to handle endogeneity problems that are taken care of in the dynamic models.

More so, given the nature of the equation, an endogeneity problem may evolve. This is where the causal variables correlate with the error term. Endogeneity also arises where there is a simultaneity of causality (that is, where both the response and predictor variables cause and are caused by each other simultaneously). In such situations, the idiosyncratic errors are likely to correlate with the explanatory variable, since such an explanatory variable has the potential of being an explained variable in the same model. Correlation between the error term and the dependent variable is normal but the relationship between them and the independent variables signals endogeneity. From literature, the variable of interest, Lerner index, natural log of total assets (size of MFIs), average loan size, and equity to total assets are likely to be endogenous. We instrumented for all endogenous variables in our estimation except the more obvious exogenous variables. That is there is the likelihood of reverse causality between the Lerner index, total assets, average loan size, equity to total assets, and ROA.

The system GMM predetermined the endogenous variables thereby instrumenting and making them uncorrelated with the error term. It does this by combining the lagged levels of endogenous causal variables and exogenous variables. The time-invariant characteristics such as MFI-specific effects may be collinear with the regressors. The idiosyncratic error (e_{it}) in equation 2 comprises of the unobserved MFI (u_i) and the observed specific effect (ε_{it}). To deal with this condition, the system GMM transformed the equation. In transforming the model using the first differencing, the MFI-specific effects will be eliminated because it does not change with time. To further deal with the concerns with the endogeneity, the profitability variable is included in the regression (Equation 2) with one-period lag. This made it the preferred estimator for the specified models. To test for robustness, we report the estimation of HHI (an alternative to Lerner index), which can guarantee the validity of our results in model 2 in Table 4.

4. Empirical Results

Table 2 reports summary statistics on the average values of the variables for the whole sample of MFIs used in the analysis. The table shows the number of observations, mean, standard deviation, minimum and maximum values of variables.

The maximum and minimum values of the variables indicated a wide variance of the variables among MFIs. There is clear evidence from the summary statistics of differences among MFIs. The average ROA of 0.39% over the entire study period from 2000 to 2014 implies that MFIs are barely profitable. This signals high competition in the industry as many firms competed for the existing profit. The mean ROA indicated the industry's profitability. The variance between the mean and the standard deviation values indicate vast profitability variances amid MFIs in our sample. This poor financial performance of MFIs might be attributed to the high operational and financial cost facing the industry.

Table 2: Summary Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Profitability	262	0.0039	0.116	-0.594	0.480
Lerner index	262	0.171	0.701	-1.956	-1.956
LnSize	262	7063225	1.14e+07	1	9.12e+07
CAP	262	0.289	0.233	-0.147	0.998
DER	262	4.416	3.704	-7.84	20.43
CRSK	262	0.067	0.067	0	0.744
LnAVL (in thousands USD)	262	446.53	646.481	15	4973
LnNAB (in thousands)	262	11671.08	21178.45	20	148020
GDPP	262	0.041	0.026	0.013	0.112
INFL	262	0.143	0.049	0.087	0.329

Source: *Authors' computation using STATA 15*

The mean Lerner index of 0.17 suggests that Ghanaian MFIs in our data set are faced with high competition compared to other studies that used Lerner to investigate competition in the banking sector. For instance, Adjei-Frimpong (2013) reported an average Lerner of 0.349 for the Ghanaian banking industry. De Guevara, Maudos and Perez (2005) also report a mean Lerner of 0.15 based on a sample of European banks for the period of 1993-2000. The average MFIs size of 7,063,225 indicates the mean amount of total assets, which, however, differs among MFIs. The largest MFI has total assets base of about 91,200,000 as compared to the smallest MFI with 11,400,000, indicating vast differences among MFIs in our sample. The best capitalized MFI in our sample, for example, has a capital ratio of 99.8% while the least MFI total equity only covered 23.3% with the average MFI having a total

capitalization of 28.9%. The debt to equity ratio of our sample for the study period indicated 441.6% on average. This implies that MFIs in our sample for the study period are extremely geared.

The portfolio at risk relative to gross loans, which is an indicator of the quality of credit portfolio amounts to 6.7% on average, which suggests a low percentage of the loans at risk of being lost. Again, there exists a large difference among the MFIs in our sample concerning this variable. The average loan size amounts to 446. 53 in USD per borrower. This variable indicates the socioeconomic level of clients. However, the maximum average loan size is USD 4,973. This implies that MFIs in Ghana are serving relatively non-poor clients. The average number of active borrowers an MFI covers for the period stands at 11671.08 per our sample. This average of outreach indicates the breadth of providing microfinance services to the poor. The MIX benchmark methodology categorise the breadth of outreach as large (> 30, 000 number of borrowers), medium (10,000 – 30,000 number of borrowers), and small (< 10,000 number of borrowers). Hence, the breadth of outreach for Ghanaian microfinance institutions is medium as the mean of 11671.08 borrowers falls between 10000 and 30000. However, the standard deviation (21178.45) is larger than the mean value indicating that there are MFIs in Ghana that have a smaller breadth of outreach (Kinde, 2012).

The gross domestic product per capita growth as one of the macroeconomic variables amounts to 4.1% on average. This variable reflects the growth of the standard of living of people within the sample period. All in all, the inflation rate amounts to 14.3% for the study. This indicates a measure of macroeconomics policy stance in the economy, which is quite high.

Table 3 presents results for multicollinearity test. The correlation between two variables determines the degree of linear relationship between the variables. This test is carried out to verify whether the experimental variables are correlated or not. The low correlation coefficients signify that there is no problem of multicollinearity. This evidence further validated the reliability of the regression analysis.

Table 3: Correlation Matrix of Explanatory Variables

	ROA	LI	lnSize	CAP	DER	CRSK	LnAVL	LnNBOR	GDP	Infl
ROA	1.0000	0.0667								
LI	0.0667	1.0000								
LnSize	-0.0257	-0.0257	1.0000							
CAP	0.0077	-0.0600	-0.4776*	1.0000						
DER	0.0005	0.0807	0.3258	-0.6466*	1.0000					
CRSK	0.0598	-0.0143	0.0051	-0.1685*	0.2012*	1.0000				
LnAVL	-0.0625	0.0424	0.6015*	-0.4639*	0.2980	-0.1510	1.0000			
LnNAB	0.0083	0.1021	0.7371*	-0.1239	-0.0059	0.0271	0.0069	1.0000		
GDPP	0.0275	0.0894	0.1452	-0.1313	0.3166*	-0.0155	0.0856	0.0488	1.0000	
INFL	-0.0793	-0.2049*	0.0346	0.1468	-0.2208*	-0.0650	0.1244	-0.0080	-0.4159*	1.0000

Note*: *indicates significance at the 10% level*

An econometric concern of the estimation technique is the fact that the errors obtained from estimating Equations 2 are likely to be serially correlated with the explanatory variables. However, the results of AR (2) in Table 4 suggest that serial correlation is absent. Despite the presence of first-order autocorrelation [AR(1)] this does not mean that the estimates are inconsistent. Inconsistency would be inferred if second-order autocorrelation was present (Blundell & Bond, 1998), but this issue is rejected by the test for AR (2). Also, there is a possible correlation amongst some of the regressors specified in the model. As presented in Gonzalez (2009), bank concentration may be associated with austere bank-entry limitations and a robust legal environment. This argument is plausible in the microfinance industry, where MFI concentration could be associated with severe entry restrictions and other legal requirements. Our model may writhe from potential endogeneity problems, amongst others, to which the effect of MFI concentration may derive from MFI competition. The system GMM alleviates these econometric concerns. The study uses the first lags and other regressors as instrumental variables which is not rejected by the Hansen test. The results in Table 4 must be carefully interpreted because the higher (lower) the value of the Lerner Index, the lower (higher) the competition among MFIs in the industry.

4.1. Competition and Profitability of Microfinance in Ghana

The results in Table 4 report the impact of firms' characteristics, market, and macroeconomics variables on profitability of MFIs in Ghana. The value of the coefficient on the lagged dependent variable, which determines the degree of persistence of our profitability measure ROA, is statistically significant at 1% for both models with coefficients 0.564 and 0.664 respectively, showing a high degree of persistence of MFIs profitability. It is credible to argue that if there is a shock to

the present profitability level, about 56% of the impact will persist to the next year. The profit persistence level is about 66% in the second model when we tested for robustness with HHI as an alternative measure of competition. These findings are consistent with Muriu (2011). This further confirms the appropriateness of the system GMM model. The results of the study indicate that the Lerner index is statistically significant and positively related to MFIs' profitability. This implies that an increase in the index (i.e reduction in competition or increase in market power) increases profitability. This indicates that increased competition has a negative relationship with profitability. Therefore, the hypothesis saying there is a significant negative relationship between competition and profitability is supported by the data. The results support the SCP hypothesis, as the structure of the MFIs industry is highly competitive and thus reduces MFIs profitability. This suggests that as competition increases, managers of MFIs are unable to find more innovative and efficient ways of managing their businesses to be profitable and are unable to achieve the objective of profitability. This finding meets our expectations and is consistent with Lee and Hsieh (2013) but contrary to Fonchamnyo *et al*. (2017), and Gwasi and Ngambi (2014). The results of the study contradict the literature on financial deepening, of enhancing efficiency with increased competition as inefficient firms are self-selected leaving only the efficient firms in the market (see Greenwood & Jovanovic,1990, King & Levine, 1993).

Unexpectedly, the coefficient of the firm size which is measured as the natural logarithm of total assets is statistically significant and negatively related to profitability. This suggests that bigger firms do not profit from product and loan diversification and/or economies of scale. This might be due to inefficiency in the management of total assets and the possible presence of diseconomies of scale. This effect can also be attributed to administrative bureaucracy, bottlenecks, and ineffective management of larger firms. Thus, the hypothesis that there is a significant positive relationship between size and profitability is rejected or not supported by the data. Our finding is in line with Ashenafi and Kingawa (2018) and Dietrich and Wanzenried (2011) but contrary to the finding of Muriu (2011), Kyereboah-Coleman and Osei (2008).

Capitalization is statistically significant at 1% level and negatively related to profitability. It implies that well-capitalized MFIs are rather less flexible in controlling unexpected losses and are faced with a high cost of external funding. It indicates that well-capitalized MFIs experience lower returns, thus increasing their finance cost and facing higher risks of being bankrupt. It means that if a rise in the level of equity could permit MFIs to decrease their levels of debt, we anticipate the finance cost of these MFIs to be lower. Hence, it is expected that profitability level should be higher for the better capitalised MFIs. However, our finding revealed that high level of equity reduces the level of profitability of MFIs. Therefore, the study rejected the

hypothesis stating that there is a positive relationship between capital ratio and MFI profitability. This evidence is consistent with Goddard *et al.* (2004) but contrary to Fersi and Boujelbéne (2016).

Table 4: Regression Analysis of MFI Profitability (System GMM)

VARIABLES	Model 1 (Profitability)	Model 2 (Profitability)
L.ROA	0.564***	0.664***
	(0.051)	(0.070)
LI	0.077***	
	(0.014)	
lnSize	-0.080***	-0.127***
	(0.016)	(0.028)
CAP	-0.482***	-0.737***
	(0.080)	(0.132)
DER	-0.013***	-0.016***
	(0.004)	(0.004)
CRSK	-0.018	-0.030
	(0.074)	(0.120)
LnAVL	0.045***	0.087***
	(0.014)	(0.025)
LnNAB	0.070***	0.095***
	(0.010)	(0.018)
GDPP	0.551	0.816**
	(0.392)	(0.402)
INFL	-0.506***	-0.747***
	(0.125)	(0.157)
HHI		13.589**
		(6.319)
Observations	194	194
Number of MFIs	58	58
No. of instruments	20	20
Waldχ^2	1738.48	1989.43
P-value	(0.000)	(0.000)
AR1(p-value)	-2.66(0.008)	-2.25(0.024)
AR(2)(p-value)	0.85(0.397)	1.74(0.082)
Hansen	6.34	7.49
(P-value)	(0.786)	(0.679)

Notes: *The dynamic model is estimated using Windmeijer –corrected standard error version of the two-step system GMM model. Robust standard errors are in parentheses. ***and ** indicate 1% and 5% levels of significance respectively.*

Interestingly, the debt to equity ratio is statistically significant and negatively related to the profitability of MFIs. This implies that MFIs could finance their operations with more debt but this will negatively impact on profitability. Intuitively, most of the MFIs in Ghana might be paying high finance cost on long term debt relative to short term debt. In conclusion, the study failed to accept the hypothesis that there is a positive relationship between debt ratio and profitability. This finding is in line with earlier studies (Sekabira, 2013; Shubita & Alsawalhah, 2012; Velnampy & Niresh, 2012).

The coefficient of credit risk indicates a negative relationship with profitability but statistically insignificant in explaining the variability in profitability. This indicates that more exposure to credit risk is associated with low profitability. The empirical results show that many MFIs with higher credit risk tend to experience a low level of profitability. Therefore, the hypothesis saying there is a negative relationship between credit and profitability is not supported by the data. This is consistent with the finding of Muriu (2011).

The average loan size which measures the depth of outreach is statistically significant and positively related to MFIs profitability. This indicates that higher loan size is associated with high profitability given that larger loans are associated with higher cost-efficiency and hence high profitability. We find convincing evidence that MFIs that have lower average loan balances are less profitable. The finding contradicts the mission drift where MFIs serve comparatively non-poor customers. Based on the hypotheses testing, the study failed to reject the hypothesis and concludes that there is a significant positive relationship between average loan size and profitability. This evidence is in line with Nyamsogoro (2010) and Adongo and Stork (2006) that profitability is associated with selling bigger loans. This may be a piece of bad news for the clients as the microfinance industry moves towards commercialization.

Similarly, the number of active borrowers which measures the breadth of the outreach of MFIs is positive and highly statistically significant at 1%. The number of active borrowers and profitability is complimentary. This is because as the number of customers increases MFIs reap economies of scale and thus reduces cost which helps them to be profitable. This indicates no evidence of a trade-off between outreach and profitability for the Ghanaian case. This can be attributed to the fact that an increasing number of active borrowers increases the volume of sales and thus maximises profitability. Therefore, the study failed to reject the hypothesis stating that there is a positive relationship between the number of active borrowers and MFI profitability. This finding is in line with Kinde (2012) and Ayayi and Sene (2010) but contrary to Quayes (2012).

GDP per capita is statistically insignificant but positively related to the profitability of MFIs. This implies that the expansion of economic conditions does not influence the profitability of MFIs. Thus, we failed to accept the hypothesis saying that there

is a significant positive relationship between GDP per capita and profitability. The result is consistent with Ashenafi and Kingawa (2018).

The coefficient of inflation is statistically significant at 1% and negatively associated with profitability. It reflects that in an inflationary environment, MFIs obtain low earnings from their operations. Generally, the cost of doing business is usually high during inflation. The finding suggests that MFIs will perform better in economies that are not largely affected by inflation. In economies that are affected by high inflation, banking activities tend to be lower as documented by Boyd, Levine, and Smith (2001). In conclusion, we failed to reject the hypothesis that there is a negative relationship between inflation and profitability. This finding is consistent with Vanroose and D'Espallier (2013).

5. Summary and Conclusions

Microfinance is often held in the literature as a tool that permits individuals exempted from the conventional financial system to gain access to sources of finance, thus reducing financial exclusion and poverty. Recent literature suggests that competition among MFIs is not only determined by the internal factors and market conditions of MFIs but the macroeconomic environment in which they operate. Determining the impact of competition on the profitability of MFIs was the main objective of this paper. The empirical results indicate that competition impacts negatively on profitability. That is, we found strong evidence that increased competition is associated with a lower profit of MFIs. The results of the study also underscore the relevance of firm characteristics and macroeconomics variables in terms of the positive relationship with MFIs' profitability except for size, capitalization, debt to equity ratio, and inflation that have a negative association with MFIs profitability.

Our findings have policy implications. The results call for designing policies to ensure that the negative effects of increased competition in the industry are reduced. These policies may include increasing the minimum capital and reserve requirements. This will prevent weak and poorly capitalised institutions from flooding the market and engendering highly risky behaviour that results in failure as witnessed in the recent past. The increase in reserve requirement will also position MFIs to be more solvent in order to accommodate any shocks within the industry and possibly panic withdrawals by customers.

The non-segregation of samples into non-profit and for-profit MFIs is a significant limitation of this study. This is because non-profit MFIs might not compete for profit in the industry and thus record low or no profit which could affect the profit level on average in our sample for the study period. This limitation does not invalidate our analysis and conclusion. However, further research with sub-samples of for-profit and non-profit MFIs could be an improvement and enhance better comparison of findings.

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APPENDICES

Regression Analysis of MFI Profitability(ROE) (System GMM)

VARIABLES	(1) model1 ROE	(2) model2 ROE
L.ROE	-0.587*** (0.054)	-0.423*** (0.070)
LI	-99.740 (70.041)	
lnSize	53.595 (55.540)	-30.945 (83.795)
EQTA	723.876 (453.427)	561.641 (463.774)
DER	27.605 (19.189)	28.377 (33.087)
PAR30	-111.077 (161.115)	-39.529 (379.991)
lnAVL	20.366 (109.527)	120.451 (165.587)
LnNBORROW	-53.409 (51.436)	-1.500 (60.544)
GDP	-778.726 (928.174)	-2,544.555 (1,985.537)
Infl	-383.341 (293.275)	-1,510.228 (974.163)
HHI		41,265.653 (29,758.395)
Observations	113	105
Number of MFICODE	35	32
Number of instruments	19	19
Waldχ^2	7172.98	442.41
P-value	0.000	0.000
AR1 (p-value)	-1.26 (0.207)	-1.53 (0.126)
AR (2) (p-value)	-1.00 (0.318)	-1.02 (0.306)
Hansen	4.51	2.00
(P-value)	(0.875)	(0.875)

Notes: *Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Figure 2: Trend of Lerner Index of MFIs

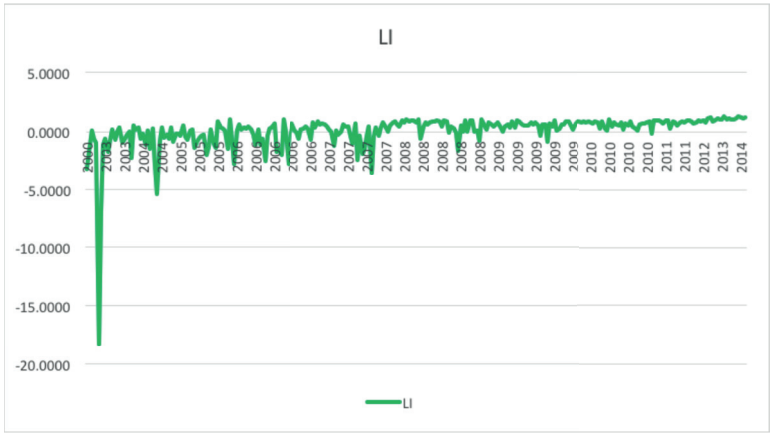

Figure 3: Comparison of ROA and ROE of MFIs Over time

Figure 4: Comparison of ROA and Lerner Index of MFIs Over time

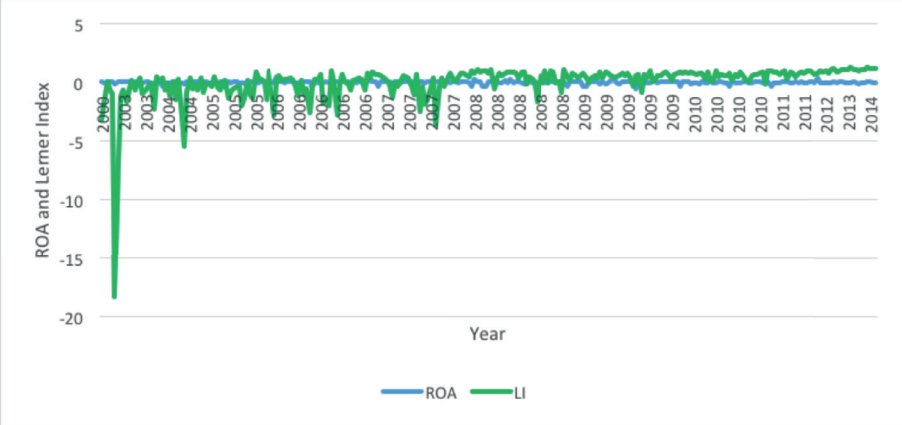

Figure 5: Comparison of ROE and Lerner Index of MFIs Over time