

# TRENDS AND PERFORMANCE EFFECTS OF COMPETITION IN THE ETHIOPIAN MICROFINANCE SECTOR

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## **Abstract**

*This paper analyses the trend of competition in the Ethiopian microfinance sector. To assess the trend of competition, we constructed a Lerner index measure of competition. It then examines the relationship between competition among microfinance institutions (MFIs) and their performance in terms of outreach, loan repayment, efficiency and financial performance. The empirical investigation is based on data from 22 MFIs for the period 2003-2009. The microfinance sector has witnessed significant growth during this period. Based on the measure of competition, we do find lower level of competition among MFIs and a general trend of falling competition over the past six years. The econometric analysis provides evidence that competition among MFIs is negatively associated with various measures of financial performance, loan repayment and efficiency. However, increased competition is found to be positively associated with outreach of MFIs.*

**Keywords:** Microfinance Institutions, Competition, Ethiopia

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## 1. Introduction

The emergence of MFIs in Ethiopia is relatively recent (less than two decades). However, the growth of the industry has been remarkable. Since the mainstream microfinance industry started operating through issuance of the Licensing and Supervisions of Micro-Financing Institutions Proclamation No. 40/1996, which authorises the National Bank of Ethiopia (NBE) to register, licence, regulate and supervise MFIs; 32 MFIs have been licensed.<sup>2</sup> By the end of 2009, MFIs in Ethiopia serve 2.33 million active clients with an aggregate loan portfolio of 388 million USD (EEA, 2011).

With growth of the industry and saturation of markets, increased competition is documented in many countries (Porteous, 2006). Some recent assessment has documented that the microfinance industry in Ethiopia is rapidly coming to maturity (MicroNed, 2008). These recent developments raise an essential question that what impact increased competition has on the financial and social performance of MFIs.

The following cases may illustrate the argument that competition with its far-reaching consequences is becoming an important facet of the microfinance industry. At the end of July 2009, an estimated 8.8 million Euro (Rs 600 million) worth portfolio of microfinance institutions (MFIs) that operate in Kolar (a town in Karnataka district of India) was reportedly involved in defaults (Srinivasan, 2009). Intense competition is considered among the root causes where it lowers borrower selection standards, weakens relationships with customers, leads to multiple loan-taking and high defaults. For instance, 25 percent of borrowers have been reported taking loans from six or more different MFIs simultaneously. The figure (of multiple loan taking) is as high as 40 percent in Morocco which, coupled with other factors, eventually leads to “repayment crisis” in the microfinance industry in late 2008 (Chen *et al.*, 2010).

Although increased competition has become an important issue for the microfinance industry, studies investigating its impact have remained limited in number. Research on this issue is important, especially because many countries have started integrating microfinance into their poverty alleviation strategy. Understanding the effects of competition can guide the design of policies which ensure benefits for the poor as much as possible.

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<sup>2</sup> National Bank of Ethiopia - [www.nbe.gov.et/financial/microfinance3.htm](http://www.nbe.gov.et/financial/microfinance3.htm), accessed 18 February 2011.

The purpose of this paper is to assess the trend of competition in the Ethiopian microfinance industry on the one hand and investigate the impact of competition on performance of MFIs on the other. It first addresses the question of whether there is increased competition on the microfinance industry by constructing a measure of market power, Lerner index. Second, it empirically investigates the effect of competition among MFIs on their performance in terms of outreach, default rates, efficiency and financial performance. It specifically addresses the association between competition and outreach in terms of the number of clients served, as well as the poverty level of clients. It also investigates whether higher levels of competition are associated with higher/lower default rates and whether higher levels of competition are associated with higher/lower levels of efficiency and better financial performance.

We perform the analysis using a panel dataset including information for 22 MFIs for the period 2003-2009.

The remainder of this paper is organized as follows. Section 2 presents an overview of the existing theoretical and empirical literature on the relationship between competition and the performance of MFIs. It also discusses the hypotheses we set to test in the empirical analysis. Discussion of the methodology employed to measure the extent of competition is also presented in this section. In section 3, we present the empirical methodology as well as the data used to investigate performance effect of competition. The results of the empirical investigation are discussed in section 4 and section 5 provides summary and concluding remarks.

## **2. Competition and Microfinance**

### **2.1. Related Literature**

In the early stages of microfinance, the idea of providing microloans to the poor as a way to alleviate poverty has appealed to and attracted social investors and Non-government Organizations (NGOs). But it is the enormous market and profit opportunity that attracts a larger involvement of commercial financial intermediaries such as international banks. Profit-oriented MFIs have become increasingly important and it has been argued that there is a continual shift in the composition of MFIs (Humble and Arun, 2009). This shift shows a changed focus, namely one from being a socially oriented organisation with a "poverty lending" approach, which focuses on reducing poverty through credit and other services that are funded by donors, government subsidies and other concessional funds

to an institution oriented with a "financial systems" approach that focuses on commercial financial intermediation among poor with an emphasis on institutional self-sufficiency. Competition is deemed inevitable following the increasing role of profit-oriented institutions. As the Consultative Group to Assist the Poor (CGAP) put it "...once microfinance institutions are committed to managing business on a commercial basis, *competition* quickly becomes a hallmark of the environment in which they operate" (CGAP, 2001, p. 2 – emphasis original).

The economics literature states that competition ensures well functioning markets, protects consumers, promotes allocative and productive efficiency and provides incentives for the development of new products. MFIs were largely operating as a monopolist in the early years (CGAP, 2001; McIntosh *et al.* 2005). Such a market power is, however, associated with allocative inefficiency, which refers to the welfare losses as a result of high prices, which monopolists normally charge. Moreover, even further loss can occur when a monopolist employs inefficient technology (productive inefficiency). Besides, there may not be pressure to invest in efficient technology and introduce new products (Motta, 2004). Therefore, it would be reasonable to assume competition can be beneficial in the context of microfinance market as it may result in improved and new financial product designs, better customer services, lower costs and lower interest rates.

The other side of the argument is that the microfinance market is a distinct market that makes use of soft-information and depends on strong MFI-client relationship. MFIs provide financial services for the poor who are not considered creditworthy by the mainstream banks. They are often praised for overcoming the problem of information asymmetry and providing loans without collateral requirements. They do so by establishing strong personal relationships with clients as well as by using other forms of collateral (such as group lending that generates social collateral). Competition and the effort to win clients and expand market share, therefore, may lead to low screening and lending standards. There are several indications of lose MFI-client relationships in the presence of intense competition. Increased competition is also associated with an increase in information asymmetry, which makes it difficult for MFIs to have information about the general debt level of clients. This in turn may lead to multiple borrowing, heavy debt burdens, low repayment rates and poor portfolio quality.

The effect of competition, as argued above, could go both ways and deserves an empirical investigation. However, very few studies examine the effect of competition

among MFIs and the literature on the topic of competition in microfinance is limited. Below is an overview of the few available related works.

The focus on making MFIs profitable (financially-sustainable), what Cull *et al.* (2009a) called “big leap”, started in the 1980s and 1990s. CGAP (2001) points out that the essential elements of this approach are competition, regulation and profitability. The paper explores the Latin American microfinance market where the commercial approach to microfinance proceeded swiftly. It describes the market as witnessing rising competition, which leads to market saturation in some countries. Olivares-Polanco (2005) examines some of the anecdotal and descriptive evidences that CGAP (2001) presents. He investigates the effect of competition by mainly focusing on outreach (measured by loan size). His findings show that increased competition results in lower outreach.

Navajas *et al.* (2003) studied competition in the Bolivian microfinance market by focusing on two major MFIs (Casa Los Andes and BancoSol), which collectively have around 40 percent market share. The results suggest that outcome of competition is ambiguous since competition leads to innovation thereby allowing MFIs to expand outreach. However, it reduces the ability of lenders to cross-subsidize less profitable smaller loans. In a similar study, Vogelgesang (2003) examines how competition affects loan repayment performance for Caja Los Andes, one of the two largest MFIs in Bolivia by the time. The analysis indicates that competition is related to multiple loan taking and higher levels of borrower indebtedness. The probability of default is also shown to be high with higher levels of indebtedness. Thus, the results seem inconclusive.

A theoretical model developed by McIntosh and Wydick (2005) characterizes the effects of competition between MFIs where increased competition leads to increased information asymmetry. As a number of competing MFIs increase in a market, which makes information sharing between them challenging, borrowers may engage in multiple borrowing which increases the debt level of clients and the probability of default. This in turn can make worse off borrowers with a single lender since this behaviour will create an externality by inciting MFIs to respond to multiple borrowing by adjusting interest rates upward. In a Ugandan microfinance market, which McIntosh *et al.*, (2005) studied, there is a rise in multiple borrowing and decline in repayment rate as competition intensifies.

Other works which do not address the effect of competition among MFIs but present an argument about the possible effects of competition includes Hermes *et al.* (2009). Their work examines how overall level of financial development in a country affects the efficiency of MFIs. After presenting a balanced argument that the effect of financial development on efficiency could be both negative and positive, they empirically document a positive effect of financial development on efficiency of MFIs. They bring forward the suggestion that through competition, and other possible channels, financial development could have an effect on efficiency. In a related work, Cull *et al.* (2009b) investigate the performance of MFIs under the pressure of competition from formal banks. Their results show that MFIs faced with high competition tend to reduce the extent of outreach but will focus more on poor clients, i.e., higher share of women borrowers and small loan size. However, the effect on other performance indicators, such as profitability, appears to be weak.

The review of previous works highlights the importance of and the surge in interest on the issue of competition. Yet, the subject remains understudied. To our knowledge, despite the remarkable growth of the microfinance industry in Ethiopia, there is no study that assesses the level of competition or investigate its effect on performance. This study is an attempt to measure and describe competition among MFIs as well as empirically assess its effect on performance of MFIs.

## **2.2 Hypotheses**

In this section, we present our hypotheses with regard to the effect of competition on social and financial performance of MFIs. We focus on outreach, loan collection, efficiency and profitability, which are the generally accepted and core outcome measures of MFIs' performance (Jansson *et al.*, 2003; Rosenberg, 2009; UNDP, undated).

### *i) Competition and Outreach*

We hypothesize the relationship between competition and outreach of microfinance institutions is ambiguous. A decrease of monopoly rents and market shares associated with increased competition may compel MFIs to expand their market base and explore new markets and (poorer) clients, implying an increase of outreach. On the other hand if increased competition is associated with rising defaults and falling profits (see also below), MFIs may engage in more cautious lending by extending loans only to borrowers they consider safe and cost effective. This may reduce outreach, as lending to new and

unexplored markets, as well as lending to poorer clients, is generally considered to be more risky and costly.

*ii) Competition and Loan Repayment /Portfolio Quality*

Many have argued intense competition and increased loan suppliers will lead to multiple-loan taking (“double-dipping”) resulting in heavy debt burden and low repayment (see for instance, McIntosh and Wydick, 2005 and McIntosh *et al.*, 2005). Moreover, as competition bounds MFIs may lower their lending and client selection standards. This in turn may increase default rates. Therefore, we expect a negative effect of increased competition on loan repayment performance. Implied in loan repayment performance is loan portfolio quality since low repayment performance (high default) is associated with low loan portfolio quality. The other issue is the welfare of borrowers as high debt levels and defaults will have a negative implication on welfare of clients.

*iii) Competition and Efficiency*

A positive association can be expected when it comes to the effect of increased competition on efficiency. This is for the reason that, as competition exacerbates MFIs would be compelled to find efficient ways of delivering services that would reduce costs and ensure them a competitive edge. But this may not be the whole story. As we argued in the previous paragraph, if increased competition results in borrower over-indebtedness and lower expected loan repayment, MFIs may engage in more screening in order to overcome this problem as well as being able to ensure higher expected repayment and higher loan portfolio quality, which raises their operational costs. Additionally, MFIs may not only compete for clients and market share but also for employees. This can lead to higher costs. As a result, the direction of the effect of intense competition on efficiency is not clear a priori.

*iv) Competition and Profitability*

We expect an increase in the level of competition to be associated with falling profit. As MFIs start operating under competitive pressure with declining market share and forgone monopoly rents, we would expect them to register low profitability, low to the point where it is not attractive for other service providers to enter the microfinance market. Table 1 summarises the hypotheses.

**Table 1: Summary of Hypothesis**

Expected effect of competition on:	
Outreach	+/-
Loan Repayment	-
Cost Efficiency	+/-
Profitability	-

### 2.3. Measurement of Competition

To empirically assess the effects of competition, we need to construct a proxy for competition. Studies on competition of MIFs are limited and the existing few empirical work have used ad hoc measures of competition. Studies on competition in banking literature have applied a better range of measures of competition. Concentration indices, such as the Herfindhal-Hirschman index (HHI), are one of the early and frequently used measures of competition, where low concentration is associated with high competition<sup>3</sup> (see, e.g., Olivares-Polanco, 2005). However, the use of this measure is criticized on the ground that first, the relation between concentration and competition is not straightforward and second, that higher concentration does not always imply a lack of competition (Bikker and Haaf, 2002).

Another measure used frequently is the Panzar-Rosse (PR) measure. The PR measure is an empirical method, measuring the impact of variations in factor input prices on firm-level revenues and uses cross-sectional data to assess competitive behaviour (Bikker and Haaf, 2002). The degree of competition in a market is reflected by an index called the H statistic, which is the sum of input price elasticities of total revenue of firms with respect to their factor input prices. The H statistic represents the degree of competition within the banking sector, where  $H=1$  implies perfect competition and  $H \leq 0$  refers to a full monopoly situation. When H is between 0 and 1, the market operates under monopolistic competition.<sup>4</sup> The PR measure is also not without limitations, however. The H statistic is only valid if the market under consideration is in long-run equilibrium. Further, Koetter *et al.* (2008) point out that, first the H statistic does not vary over time,

<sup>3</sup> The HHI is the sum of the squared market shares of assets of all banks, ranging from zero to one. A large number of banks, each with a small share, produce an HHI close to zero. A monopolist bank with a 100 per cent share produces an HHI of one.

<sup>4</sup> In a monopoly market, H is negative, as an increase in input prices will increase marginal costs and reduce equilibrium output, and subsequently a decline in total revenue given the profit maximization hypothesis. In contrast, in a perfectly competitive market, H is equal to one, as any increase in input prices raises both marginal and average costs and in turn leads to a one-to-one increase in total revenue, without changing the optimal output of banks. This is true since those institutions that cannot cover the increase in input prices through increased revenue will be forced to exit the market. If the market structure is characterized by monopolistic competition, H will be between zero and one, with the total revenue rising less than proportionally to the changes in input prices.



making it less relevant to investigate the evolution of competition, and second that it is a measure at the industry level, thus not allowing for the measurement of competition at the individual firm level.

A third and frequently used measure of competition in banking is a direct measure of market power often measured by the Lerner index (see, e.g., Angelini and Cetorelli, 2003; Fernández de Guevara *et al.*, 2005, 2007; Maudos and Fernández de Guevara, 2004, 2007; Koetter and Vins, 2008; Koetter *et al.* 2008). This index is a firm-level measure of competition and may vary over time, which is why we prefer this measure over the PR approach. The index measures competition by examining the difference between the output price and the marginal cost of production (scaled by the output price) at the firm level. The Lerner index ranges between 0 and 1. In a perfectly competitive market, where price is equal to marginal cost, the value of the Lerner index equals 0, whereas in a monopolistic market, where firms can set prices above marginal cost, the index will be close to 1 (Fernández de Guevara *et al.*, 2005). Although the measure has been widely used in the banking literature, it is rarely applied to microfinance. Assefa *et al.* (2010) assessed the effect of competition on performance using a larger set of MFIs. For that end they constructed a Lerner index using information for 362 MFIs in 73 countries for the period 1995-2009. This study follows similar approach to measure competition in the Ethiopian microfinance industry.

#### ***Estimation of the Lerner Index***

The Lerner index is empirically approximated by:

$$L = \frac{(p - MC)}{p} \quad (1)$$

where  $p$  is output price and  $MC$  total marginal cost. The output price, which is a measure of average revenue, is calculated as the ratio of total operating income (interest income plus other operating income) to total assets (Maudos and Fernández de Guevara, 2004). The marginal cost is derived from a standard translog cost function of the form:

$$\begin{aligned}
\ln C_{it} = & \alpha_0 + \alpha_1 \ln y_{it} + \frac{1}{2} \alpha_2 (\ln y_{it})^2 + \sum_{j=1}^2 \beta_j \ln w_{jit} + \sum_{j=1}^2 \frac{1}{2} \gamma_j (\ln w_{jit})^2 \\
& + \sum_{j=1}^2 \xi_j \ln y_{it} \ln w_{jit} + \sum_{j < k} \gamma_{jk} \ln w_{jit} \ln w_{kit} + \delta_1 \text{trend} \\
& + \frac{1}{2} \delta_2 \text{trend}^2 + \delta_3 \ln y_{it} \text{trend} + \sum_{j=1}^2 \eta_j \ln w_{jit} \text{trend} + s_{it}
\end{aligned} \tag{2}$$

where  $C_{it}$  is the total production cost of MFI  $i$  at year  $t$ . The explanatory variable  $y$  represents output and  $w_j$ s represents input prices. We follow a specification similar to Hermes *et al.* (2009), a study that employs the above cost estimation for MFIs. Total cost ( $C$ ) is the sum of financial and operating costs of MFIs. In specifying the output and input of MFIs, we assume an intermediation approach.<sup>5</sup> We use total assets as a measure of output ( $y$ ). We also assume the use of two inputs by MFIs, which are labor ( $w_1$ ) and capital ( $w_2$ ).<sup>6</sup> The cost of labor (salary) is computed as a ratio of personnel expense to the number of employees. Similarly, the price of the second input is measured by the ratio of operating expense (less personnel expenses) to net fixed assets. The cost function is estimated by including a time **trend** to capture the effect of technological change and MFI specific fixed-effect to deal with unobserved MFI heterogeneity and associated difference in cost.<sup>7</sup>

Once we estimate the cost function, marginal cost (**MC**) is obtained by taking the derivative of the cost function with respect to  $\ln y_{it}$  and given by:

$$MC_{it} = \left( \frac{C_{it}}{y_{it}} \right) (\alpha_1 + \alpha_2 \ln y_{it} + \sum_{j=1}^2 \gamma_j \ln w_{jit} + \delta_3 \text{trend}) \tag{3}$$

Data for MFI-level marginal cost are obtained by using MFI-level data for total cost, total output, input variables and the trend variable, in combination with the estimated

<sup>5</sup> This approach considers MFIs as intermediaries. As intermediaries, they have the responsibility of transferring financial assets from the savers (the surplus unit) to the investors (deficit unit). In this case the inputs can be defined as labour, capital cost and interest payable on deposits. Loans and financial investments are considered as outputs.

<sup>6</sup> We also consider a third input, deposit, and the cost associated with it, i.e. the interest expense by using ratio of financial expenses to total deposits as a proxy. Although MFIs in Ethiopia are mandated to collect deposits, limited numbers of MFIs have data on deposits that substantially reduce the number of observations. Therefore, we delimit the analysis to two inputs. Data is discussed below.

<sup>7</sup> Alternatively, we have estimated the cost function by imposing a homogeneity of degree one restriction on input prices, which translates into the restriction,  $\sum_{j=1}^2 \beta_j = 1$ ,  $\sum_{j=1}^2 \xi_j = 0$ ,  $\sum_{j < k} \gamma_{jk} = 0$  (Kotter *et al.*, 2008). However, the results of the cost function as well as the Lerner indices are remarkably similar.

coefficients from the trans-log cost function ( $\alpha_1, \alpha_2, \gamma_j$ s and  $\delta_3$ ). Table 2 provides information on the outcomes of the estimation of the cost function.

**Table 2: Estimation Result of the Cost Function**

Dependent Variable	Ln (total cost)	Dependent Variable	Ln (total cost)
lnw <sub>1</sub>	-4.902 (3.708)	Trend	0.0150 (0.0193)
lnw <sub>2</sub>	0.485 (1.021)	trend <sup>2</sup>	5.26e-06 (6.48e-05)
(lnw <sub>1</sub> ) <sup>2</sup>	0.474* (0.276)	lny*trend	0.00182** (0.000831)
(lnw <sub>2</sub> ) <sup>2</sup>	0.0686 (0.0497)	lnw <sub>1</sub> *trend	-0.00570* (0.00317)
lny*lnw <sub>1</sub>	-0.0578 (0.0632)	lnw <sub>2</sub> *trend	0.000532 (0.00142)
lny*lnw <sub>2</sub>	0.0551** (0.0271)	Constant	18.67 (13.45)
lnw <sub>1</sub> *lnw <sub>2</sub>	-0.189 (0.153)	Observations	83
		R-squared	0.96
		Number of MFIs	19

Standard errors in parentheses; \*\*\*, \*\*, \* - significant at 1%, 5% and 10%, respectively

### 3. Empirical Approach

#### 3.1. Methodology

We estimate a linear regression model where a several performance measures are regressed on the Lerner index, our measure of competition and a set of other explanatory variables. The estimation equation takes the form:

$$y_{it} = x_{it}\alpha + z_t\beta + \gamma L_{it} + \eta_i + \varepsilon_{it} \quad (4)$$

where  $y$  is a measure of performance of MFI  $i$  at year  $t$  and  $L$  is our measure of competition, the Lerner index.  $x_{it}$  and  $z_t$  are vectors of MFI and country characteristics, respectively, that may influence performance. An expanded representation of the variables follows below. Given the panel structure of our data, we carry out the estimation by including MFI-specific effects. We apply a Hausman test to compare between fixed and random effects estimates.

As discussed above, we look at four dimensions of social and financial performance of MFIs: outreach, loan repayment, cost efficiency and profitability. We use three widely used measures for outreach of an MFI (Olivares-Polanco, 2005; Ahlin *et al.*, 2010; Cull *et al.*, 2009b; Hermes *et al.*, 2009). First, we measure the breadth of outreach by the number of active borrowers of an MFI (***a-borrower***). Moreover, loan size, measured as the average loan balance per borrower (***l-size***) and the number of women borrowers as a share of all borrowers (***w-borrower***) of an MFI are included in the analysis. The latter two measures are proxies for the depth of outreach, referring to the extent to which an MFI reaches out to poor clients.

We have two commonly used measures of the cost efficiency of an MFI, i.e. the operating expenses ratio (***oer***), which is the ratio of operating expenses to average gross loan portfolio and the average cost per borrower (***cbp***).

With respect to the performance in terms of loan repayment and loan portfolio quality we use three measures: the portfolio at risk greater than 30 days (***par30***) and 90 days (***par90***) and the write-off ratio (***wor***). The first two are measures of the share of the loan portfolio of an MFI that is overdue (30 or 90 days) and is at risk of not being repaid. ***wor*** measures the share of outstanding loans that is expected not to be repaid.

We measure profitability of MFIs in terms of the return on assets (***roa***) and financial sustainability as measured by their operational self-sufficiency (***oss***).

Next to the Lerner index, our measure of competition at MFI-level, we use the following MFI-specific explanatory variables: ***age*** (number of years since establishment), ***age squared*** and ***size*** (measured as the log of total assets) and ***r-yield*** (real yield, which is used as a measure for the average interest charges customers of the MFI face). In addition, we add a number of country-level variables, controlling for the macroeconomic environment (i.e. real GDP growth (***gdpg***), inflation (***infl***), industry value added to GDP (***indu***), share of rural population (***rupop***) and the level of financial development (i.e. private credit to GDP ratio (***pcr***)). These variables have been used in other cross-country studies focusing on explaining MFI performance (see, e.g., Ahlin *et al.*, 2010; Cull *et al.*, 2009b, Vanroose and d’Espallier, 2009; Hermes *et al.*, 2009).<sup>8</sup> Table 3 provides a description of all variables used in the analysis.

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<sup>8</sup> See these references for a more elaborate discussion of the relationship between the macroeconomic, institutional and financial development variables on the one hand and MFI social and financial performance on the other hand.

**Table 3: Description of Variables and Sources**

	<b>Variable</b>	<b>Description</b>	<b>Source</b>
Microfinance Institutions Data	<b>Age</b>	Years functioning as an MFI. Age at year $t$ is $t$ -year of establishment.	the MIX, own calculation
	<b>size</b>	Total of all net asset accounts	the MIX
	<b>r-yield</b>	Interest and fees on loan portfolio/loan portfolio adjusted for inflation	the MIX
	<b>a-borrower</b>	The number borrowers who currently have an outstanding loan balance or are primarily responsible for repaying any portion of the loan portfolio	the MIX
	<b>w-borrower</b>	Ratio of number of women borrowers to number of active borrowers	the MIX
	<b>l-size</b>	Average loan size in USD	the MIX
	<b>Oer</b>	The ratio of operating expenses to gross loan portfolio	
	<b>Cpb</b>	The ratio of operating expense to number of active borrowers	the MIX
	<b>par30</b>	The ratio of portfolio at risk > 30 days to gross loan portfolio	the MIX
	<b>par90</b>	The ratio of portfolio at risk > 90 days to gross loan portfolio	the MIX
	<b>Wor</b>	The share of total amount of loans that are written-off from the gross loan portfolio	the MIX
	<b>Oss</b>	The ratio of financial revenue to financial expenses, loan provision expenses and operating expenses	the MIX
	<b>Roa</b>	Net operating income, less taxes / assets	the MIX
<b>Lerner</b>	The difference in price and marginal cost scaled by price	Own calculation	
Macroeconomic Data	<b>Gdpg</b>	Real GDP per capita growth	WDI
	<b>Infl</b>	Inflation rate, GDP deflator	WDI
	<b>indu</b>	Industry value added as percentage of GDP	WDI
	<b>rupop</b>	Share of rural population (percentage)	WDI
	<b>pcr</b>	Private credit by deposit money banks and other financial institutions as a share of GDP	WDI

the MIX- the Microfinance Information Exchange ([www.mixmarket.org](http://www.mixmarket.org))

WDI- World Development Indicators Online ([data.worldbank.org](http://data.worldbank.org))

### 3.2. Data and Sources

As was already discussed above, we use the MIX market data base for the measurement of the Lerner index. Moreover, data for MFI-specific variables, including our measures of social and financial performance, are also taken from this source. This database has been widely used in the microfinance literature. Reporting to MIX market by MFIs is done on a voluntary

basis, which may, at least potentially, have consequences for the continuity and reliability of the data. We included MFIs that report for at least two years. Although there are some MFIs that report balance sheet and income statement information dating back to 1998, we limit ourselves to 2003 since information dating back to this year is not sufficiently available. A total number of 22 MFIs report to the MIX market out of which 21 are included in this study. We believe this is a representative sample given it is nearly 66 percent of the total Ethiopian MFI population and has included the largest service providers. The information collected on the 21 MFIs over the period 2003-2009 renders 118 observations.

**Table 4: List of Microfinance Institutions**

ACSI - Amhara Credit and Savings Institution	Letta
ADCSI - Addis Credit & Savings Institution	Meklit Metemamen
AVFS - Africa Village Financial Services	OCSSCO: Oromia Credit and Saving S. Co.
Benishangul: Benishangul Gumuz Micro Financing S.C.	OMO: Omo Microfinance Institution
Buusa Gonofa - Buusaa Gonofaa	PEACE: Poverty Eradication & Community Empowerment
DECSI - Dedebit Credit and Savings Institution	SFPI: Specialized Financial and Promotional Institution
Degaf	Shashemene
Eshet	Sidama
Gasha	Wassa
Harbu	Wisdom

Yet, due to missing values with respect to either of components of the Lerner index (i.e. price and/or marginal cost) several observations had dropped from the initial dataset. Moreover, in very few cases we found values for the Lerner index outside the 0 to 1 range. These observations were treated as outliers.<sup>9</sup> The final sample contains 83 observations relating to the 19 MFIs, which are listed in Table 4.

Information with respect to the macroeconomic and financial development variables is taken from the World Development Indicators (WDI) of the World Bank. Combining micro and macro variables result in a further loss of observations. Tables 5a and Table 5b provide descriptive statistics of the dependent and explanatory variables, respectively. Table 5c

<sup>9</sup>Theoretically it is possible to observe values for the Lerner index below zero. This would indicate that organizations are making losses as marginal costs are higher than marginal returns. In the context of our analysis, if we observe MFIs still being in business while they have a Lerner index below zero, this may indicate that they obtain substantial subsidies to cover costs. A Lerner index with a value above one means that either price or marginal cost is negative, which seems to be unrealistic. For these reasons, we have considered these cases to be outliers. We estimated the cost function and calculated the Lerner index in two steps. In the first step we calculated the cost function and Lerner index using the full sample and deleted values of the Lerner index below 0 and above 1 (two observations were below zero); in the second step we repeated the calculation of the cost function and Lerner index, returning observations for the Lerner index that range between 0 and 1 only.

presents correlation coefficients of the explanatory variables. The results in Table 5c suggest that most of the correlations between explanatory variables are low, with the exception of the correlation between: inflation and real yield; inflation and rural population; and private credit and rural population.

**Table 5a: Descriptive Statistics of Dependent Variables**

	Variable	Obs.	Mean	Median	SD	Min.	Max.
Outreach	<i>a-borrower</i>	83	98683.72	18217	175187.7	1917	710576
	<i>w-borrower</i>	80	0.507805	0.51165	0.197501	0.0964	0.9347
	<i>l-size</i>	83	123.1446	114	58.27754	37	374
Efficiency	<i>Oer</i>	78	0.153926	0.1361	0.102363	0.0251	0.6432
	<i>Cpb</i>	76	14.52632	15	5.802238	4	31
Profitability	<i>Roa</i>	77	0.021069	0.0218	0.053076	-0.2216	0.0985
	<i>oss</i>	83	1.272416	1.1786	0.446608	0.3488	2.3179
Loan Repayment	<i>par30</i>	81	0.076724	0.0385	0.096543	0	0.53
	<i>par90</i>	81	0.061644	0.0286	0.07591	0	0.3731
	<i>Wor</i>	75	0.011031	0	0.021916	-0.001	0.1024

**Table 5b: Descriptive Statistics of Independent Variables**

Variable	Obs.	Mean	Median	SD	Min.	Max.
<i>Age</i>	83	7.084	7	2.577	1	14
<i>size</i> (mill. USD)	83	22.5	2.865	47.0	0.33	198.0
<i>r-yield</i>	78	0.0499885	0.056	0.118	-0.231	0.419
<i>Gdpg</i>	78	7.089744	8.5	4.759641	-5	11
<i>Infl</i>	78	14.70513	12	7.831188	4	30
<i>Indu</i>	78	13.25641	13	0.439477	13	14
<i>Rupop</i>	78	83.64103	84	0.482805	83	84
<i>pcr</i>	78	20.70513	20	2.336103	18	24

**Table 5c: Correlation Matrix (pairwise correlation)**

	<i>age</i>	<i>size</i>	<i>r-yield</i>	<i>gdpg</i>	<i>infl</i>	<i>indu</i>	<i>rupop</i>	<i>pcr</i>	<i>lerner</i>
<i>age</i>	1								
<i>size</i>	0.6402*	1							
<i>r-yield</i>	-0.4451*	-0.3389*	1						
<i>gdpg</i>	0.2990*	0.0891	0.075	1					
<i>infl</i>	0.4399*	0.2261*	-0.8254*	-0.0456	1				
<i>indu</i>	-0.4178*	-0.1413	0.4279*	-0.5078*	-0.4683*	1			
<i>rupop</i>	-0.4483*	-0.2134	0.5835*	-0.2288*	-0.8012*	0.4394*	1		
<i>pcr</i>	-0.1711	-0.129	0.2834*	0.055	-0.4939*	-0.3049*	0.6994*	1	
<i>lerner</i>	0.3875*	0.4143*	0.0042	0.0015	0.1443	0.0353	-0.1506	-0.1899	1

\* indicates significance at 5% level

## 4. Empirical Analysis

### 4.1. Trends of Competition

Table 6 provides information on the average value of the Lerner index. The average Lerner index is 0.66. The outcome suggests that MFIs in our sample face modest competition and enjoy reasonable market power. The result of the Lerner index is higher compared with those studies in the banking industry using the same method. For instance, Maudos and Fernández de Guevara (2004) report an average Lerner index of 0.15 based on a large sample of European banks for the period 1993-2000. Fernández de Guevara *et al.* (2007), using a sample of banks from a larger number of European countries for the same period, the average Lerner index is reported to be of similar size. The outcomes are also higher compared with that of Assefa *et al.* (2010) that reports an average Lerner index of 0.582 for MFIs and 0.577 for MFIs located in Africa. Generally, there seems to be lower level of competition in the Ethiopian microfinance industry. The level of competition also changes over time as shown in Figure 1.

**Table 6: Summary of Lerner Index**

	Obs.	Mean	Median	SD	Min.	Max.
<b>Lerner Index</b>	83	0.664	0.699	0.132	0.114	0.838
<b>Lerner Index by Year</b>						
2003	10	0.661	0.674	0.116	0.462	0.815
2004	10	0.678	0.699	0.109	0.511	0.838
2005	14	0.619	0.654	0.192	0.114	0.814
2006	16	0.642	0.665	0.154	0.290	0.825
2007	15	0.670	0.689	0.108	0.502	0.836
2008	13	0.709	0.725	0.088	0.473	0.835
2009	5	0.703	0.706	0.103	0.552	0.836

**Figure 1: Evolution of the Lerner Index, 2003-2009**

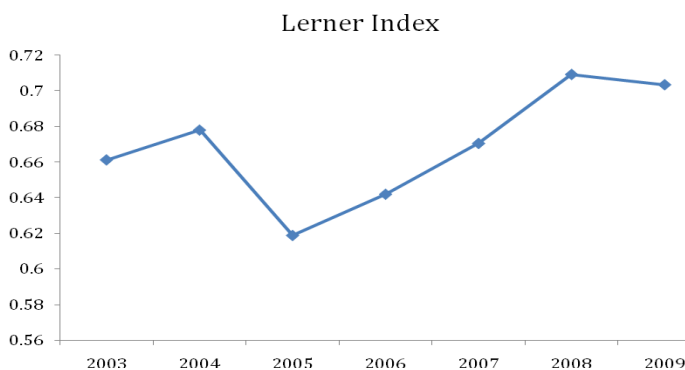
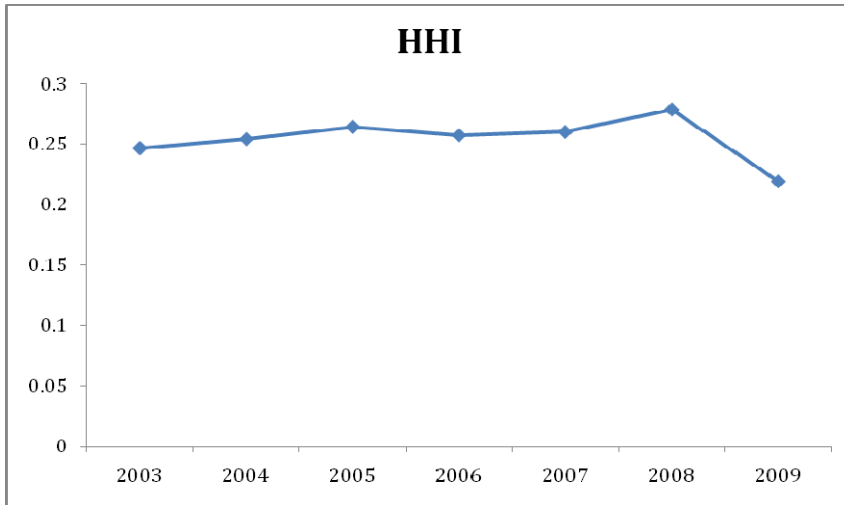




Figure 1 shows that over the past five years the average value of the Lerner index has gradually increased, which suggests that competition among MFIs is limited despite the progressive growth the Ethiopian microfinance industry. As a robustness check to the result of the Lerner index, we computed the Herfindhal-Hirschman Index (HHI) measure of competition. The results of the later, which shows an increased concentration, corroborate the result about the level of competition obtained through the Lerner index. See Figure 2 for the evolution of HHI.

**Figure 2: Evolution of the HHI Index, 2003-2009**



## 4.2 Effects of Competition on Performance

Estimation results of the empirical model described in equation (4) are presented in Table 7. Table 7a reports the estimation results of the association between competition and performance where outreach and efficiency are the dependent variables. Similarly, Table 7b describes the results for loan repayment and profitability.

As explained above, the Lerner index, our measure of competition, takes a value between 0 and 1 and there is an inverse relation between competition and Lerner index, i.e. a low (high) value of the index indicates high (low) competition. For ease of interpretation of the estimation results, we have multiplied the values for the Lerner index with -1.

**Table 7a: Estimation results – Effect of competition on outreach and efficiency**

variables	<i>a-borrower<sup>a</sup></i>	<i>w-borrower</i>	<i>l-size<sup>a</sup></i>	<i>oer</i>	<i>cpb<sup>a</sup></i>
<i>age<sup>a</sup></i>	5.252*** (1.554)	-0.492 (0.389)	0.510 (0.605)	-0.102 (0.113)	-0.902 (0.663)
<i>age2</i>	-1.945** (0.945)	0.276 (0.263)	-0.163 (0.431)	0.0175 (0.0724)	0.365 (0.423)
<i>r-yield</i>	-0.702 (1.118)	0.760** (0.348)	-1.875*** (0.570)	0.643*** (0.0900)	1.002* (0.523)
<i>gdpg</i>	-0.0758* (0.0420)	0.0262** (0.0113)	0.00102 (0.0188)	0.00754** (0.00314)	0.0529*** (0.0182)
<i>linff<sup>a,b</sup></i>	-1.053* (0.553)	0.552*** (0.159)	-0.326 (0.270)	0.232*** (0.0430)	0.844*** (0.249)
<i>indu</i>	-0.451 (0.740)	0.298 (0.218)	-0.167 (0.396)	0.0147 (0.0583)	0.495 (0.338)
<i>rupop</i>	-0.138 (0.621)	0.107 (0.180)	-0.161 (0.320)	0.178*** (0.0486)	0.000121 (0.283)
<i>pcr</i>	-0.00827 (0.134)	0.0178 (0.0386)	0.0132 (0.0696)	-0.0230** (0.0105)	0.0294 (0.0607)
<i>lerner</i>	0.200 (0.593)	0.103 (0.175)	-1.082*** (0.277)	0.495*** (0.0471)	1.111*** (0.273)
Constant	23.83 (43.95)	-13.75 (12.93)	19.57 (22.80)	-14.65*** (3.455)	-5.256 (20.10)
R-squared	0.78	0.23	0.72	0.84	0.43
Hausman test [ <i>p</i> -value]	0.1403	0.9104	0.3679	0.9048	1.0000
Observations	73	70	73	73	72
Number of MFIs	17	17	17	17	16

<sup>a</sup> A logarithm of variable is included in the estimations; <sup>b</sup> for inflation, the transformation to logarithm is of the form  $\ln(1 + \text{inflation})$ ; standard errors in parentheses; \*\*\*, \*\*, \* - significant at 1%, 5% and 10%, respectively.

The results in Table 7a with respect to social performance in terms of outreach show that there is some evidence that higher competition is associated with higher outreach. The coefficient for our competition measure is positive for number of active borrowers and share of women borrower, negative for average loan size and statistically significant in only the last case. The results suggest that competition is associated with an increase in outreach both in terms of width (number of clients) and depth (i.e. poverty level of clients). This supports the hypothesis that increased competition forces MFIs to expand their market base and explore new markets and (poorer) clients.

**Table 7b: Estimation results – Effect of competition on loan repayment and profitability**

variables	<i>par30</i>	<i>par90</i>	<i>wor</i>	<i>oss</i>	<i>roa</i>
<i>age</i> <sup>a</sup>	0.0857 (0.175)	0.0598 (0.168)	-0.112** (0.0568)	1.365** (0.593)	0.0719 (0.0721)
<i>age2</i>	-0.0555 (0.115)	-0.0408 (0.115)	0.0780* (0.0407)	-0.826** (0.399)	-0.0392 (0.0483)
<i>r-yield</i>	-0.0890 (0.147)	-0.116 (0.150)	0.0550 (0.0534)	0.300 (0.518)	0.0600 (0.0622)
<i>Gdp</i>	-0.00397 (0.00490)	-0.00144 (0.00488)	0.000210 (0.00176)	0.00205 (0.0171)	0.00180 (0.00205)
<i>linfl</i> <sup>a,b</sup>	-0.0276 (0.0687)	-0.0186 (0.0698)	0.0181 (0.0251)	-0.0453 (0.242)	0.0263 (0.0290)
<i>Indu</i>	-0.00384 (0.0945)	0.0540 (0.0980)	-0.0244 (0.0368)	0.159 (0.335)	0.0527 (0.0402)
<i>Rupop</i>	0.00293 (0.0785)	-0.0451 (0.0808)	0.0217 (0.0298)	-0.0493 (0.277)	-0.0272 (0.0333)
<i>Pcr</i>	-0.000718 (0.0169)	0.0114 (0.0174)	-0.00556 (0.00646)	0.0245 (0.0596)	0.00720 (0.00716)
<i>Lerner</i>	0.0542 (0.0754)	0.0691 (0.0754)	0.0198 (0.0267)	-2.082*** (0.264)	-0.324*** (0.0317)
Constant	-0.0614 (5.599)	2.923 (5.769)	-1.315 (2.120)	-0.0644 (19.76)	1.063 (2.376)
R-squared	0.16	0.11	0.09	0.63	0.78
Hausman test [ <i>p</i> -value]	0.9977	0.9991	0.3274	0.9941	0.9988
Observations	72	72	71	73	72
Number of MFIs	16	16	17	17	16

<sup>a</sup> Logarithm of the variable is included in the estimations; <sup>b</sup> for inflation, the transformation to logarithm is of the form  $\ln(1 + \text{inflation})$ ; standard errors in parentheses; \*\*\*, \*\*, \* - significant at 1%, 5% and 10%, respectively.

For loan repayment performance, Table 7b shows that there seems to be support that competition is associated with this financial performance of MFIs. The coefficient of the competition measure is positive for all three measures of repayment performance and it is significant for two (*par90* and *wor*). These results strongly suggest that more competition leads to more loans at risk and higher levels of loan write-offs (i.e. lower loan repayment performance).

With respect to efficiency we find evidence that more competitive markets are associated with higher costs for MFIs. For both measures of cost efficiency (i.e. operating expenses ratio and the cost per borrower) the coefficient for the competition is positive

and significant. This lends support to the hypothesis that higher competition leads to lower repayment rates and default rates, adding to the costs of lending. It may also support the notion that in highly competitive environments MFIs are not only competing for clients and market shares, but also for inputs such as capital and labour. Increased competition for these inputs may lead to rising interest rates at which they borrow money and to higher loan officer salaries, leading to higher costs.

Finally, Table 7b shows that with respect to profitability (financial performance) higher competition is associated with lower return on assets and lower operational self-sufficiency, since the coefficient of the competition measure is negative and significant in both cases. These results support the hypothesis that increased competition is associated with falling profitability: due to competitive pressure, market shares and monopoly rents decline, forcing MFIs to have reduced profit rates.

The focus of the analysis is on the relationship between competition and social and financial performance, controlling for macroeconomic, institutional and financial development variables.

The results for the control variables in the model are not significant in several cases, but the general picture that emerges is that the association between macroeconomic conditions and financial development on the one hand, and social and financial performance of MFIs on the other hand, are in line with those that have been reported in previous empirical work (see, e.g., Ahlin *et al.*, 2010; Cull *et al.* 2009b; Hermes *et al.*, 2009).

To summarize, our empirical results by and large point towards adverse associations between competition and financial performance of MFIs. Competition appears to be negatively associated with loan repayment, efficiency and profitability. However, the association with outreach is positive. Table 8 summarizes the results of the empirical analysis.

**Table 8: Summary of Results**

Expected effect of competition on:	Expected Sign	Estimated Sign
Outreach	+/-	+
Loan Repayment	-	-
Cost Efficiency	+/-	-
Profitability	-	-

## 5. Summary and Conclusion

Given significantly large numbers of people in developing countries are financially excluded and the relative success of MFIs in promoting access to finance for the poor, it is not surprising to see MFIs get the global attention they are enjoying. In Ethiopia, the emergence of microfinance activities is recent. Yet, the growth of the microfinance industry is remarkable.

It has been observed that one consequence of growth of the microfinance sector and a rise in the number of microfinance service providers is strongly increasing competition. The effect of such competition on the performance of MFIs is ambiguous at best, as we have discussed section 2. In this paper, we first assess whether the growth of the microfinance industry in Ethiopia is associated with increased competition. For that end we employ a Lerner index measure of market power, which a widely used measure of competition in the banking literature and getting recent attention in the microfinance literature. Second, using the computed measure of competition we assess the effect of increased competition on the social and financial performance of MFIs, namely outreach, efficiency, portfolio quality and profitability (financial sustainability).

The results of our empirical investigation indicate that since 2005 competition in microfinance has subdued. The results further indicate that MFIs have higher outreach when faced with more intense competition. We also find that increased competition is associated with lower levels of loan repayment, lower financial performance and lower efficiency. The analysis seems to support the view of those who see increased competition of the microfinance sector as a threat to its longer term stability and success, both in terms of its social and financial objectives.

Despite the recent growth and relatively larger loan provisions by MFIs than commercial banks<sup>10</sup>, there is still large unmet demand and the number of MFIs that are operating is lower than the ideal number that should be operating (Haftu, 2005). Given the structure of the microfinance sector where there is high concentration and high unmet demand, it may not be surprising to find low competition among MFIs. But if experience of other countries is a guide, we would expect more microfinance service providers, market saturation and increased competition. One implication that emerges from this study is

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<sup>10</sup> According to CGAP (2009), the number of bank loans per 1,000 adults is 1.3 while the number of MFIs loans per 1,000 is 50.4.

that increased competition may prove beneficial in terms of reaching out more borrowers and poorer clients. However, it is associated with lower efficiency, lower financial performance and higher default rates. Coordinated efforts to ensure the growth of the sector and minimize the negative effects of competition may therefore be required. These efforts may include putting in place regulatory measures, promoting information sharing between MFIs and financial literacy of clients as well as enhancing efficient service provisions. The efforts may: ensure MFIs do not compromise lower lending standards for increased market share; contribute to lower delinquency rates as well as helping to improve borrowers' welfare by preventing borrowers from taking multiple loans; help clients in their borrowing decisions and reduce the risk of multiple loan-taking and contribute to lower delinquency; and decrease operating costs thereby increasing their cost efficiency.

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