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Introduction

Microfinance is a high touch, high cost business. As a business model, its greatest challenge is to lower operating costs in order to reduce the cost of service borne by borrowers. An analysis of the cost structure of profitable MFIs (microfinance institutions) reporting to the Microfinance Information Exchange, Inc. (MIX) confirms this assertion: in 2006 operating expenses (both personnel and administrative) represented 62 percent of charges to borrowers, financial expenses 23 percent, profits 10 percent, and losses from defaults five percent. Since operating expenses are the main component of interest rates, identifying their drivers and quantifying them constitute the first steps in finding ways to improve efficiency of microfinance institutions worldwide.

This original paper has two main goals. One is to explore potential drivers of costs including MFI characteristics, country infrastructure (both physical and institutional), prices and availability of inputs, doing business environment and macroeconomic variables. The second goal is to explore the general correlation between costs and variables associated with the provision of financial services by non-microfinance banks.

There are other ways to measure efficiency², but for purposes of this article we will focus on efficiency measured as operating expense ratio (OER) over average gross loan portfolio (GLP). The main reason

for this choice is the simple link between OER and interest rates. For example, if an MFI reduces OER five percentage points without changes in losses from defaults and financial expenses, this MFI could potentially reduce the interest rate five percentage points, or increase profits five percentage points (as percentage of average GLP), or any combination of both that adds to a total change of five percentage points.

Sample Description

The sample consists of 1,003 MFIs in 84 countries reporting data to the Microfinance Information Exchange, Inc. (MIX), primarily in the period of 1999 to 2006. These MFIs represent 44 million borrowers with 21 billion USD in loan portfolio in 2006. This sample is smaller than the total sample used to generate the 2006 benchmarks published in this MBB because some of the explanatory variables were not available for all countries in the sample.

Drivers of Costs and the Empirical Approach or Explanatory Variables:

The drivers of costs considered in the paper can be grouped into two broad categories: MFI characteristics and country characteristics. The full list is presented in the text box below. MFI characteristics are necessary to capture cost differences between different MFIs in the same country. For example, average loan size captures the fact that smaller loans are more expensive to disburse (per one USD loaned) than larger loans. The number of borrowers was included because it is expected that larger MFIs are more efficient than smaller MFIs, due to the potential dilution of fixed

¹ This article summarizes the main results from Gonzalez, Adrian (2007) "Efficiency Drivers of Microfinance Institutions (MFIs): Operating expenses and its drivers," MIX Discussion Paper No. 2, November 2007, available online at <http://www.themix.org/publications.aspx>, under the Industry Level\Discussion Papers section.

² Like cost per borrower, number of borrowers and savers per staff, or difference (spread) between lending rates and deposit rates.

costs over a larger base. Age was considered in an effort to capture differences between mature and young MFIs, and the number of borrowers per staff was included to capture differences in productivity that may have an influence on costs.

On the other hand, country characteristics are necessary to capture differences between MFIs in different countries. In particular, we focus on physical infrastructure and density of target population, financial infrastructure (institutional), price and availability of inputs, doing business, and macroeconomic environment. For example, MFIs operating in countries with better roads are expected to have lower costs than those in countries with bad roads. And MFIs operating in countries with higher density of population are expected to have lower cost than those operating in countries where clients are more disperse. Production of electricity per capita is intended to capture the different levels of access to this service, and electricity outages is intended to capture interruptions in the service that may force MFIs to operate with more inefficient technologies than in countries without frequent electricity outages. The decision to add the last two

variables was inspired by infrastructure-challenged countries, especially in sub-Saharan African, where electricity blackouts are common.

It is expected that credit bureaus will help improve efficiency of MFIs, especially on individual lenders that share information with other lenders. In addition, the operation of a credit bureau can signal a certain level of development of other elements of the financial and physical infrastructure, such as regulations and telecommunications networks, that may have a positive influence on the efficiency of MFIs (even if they don't report to the bureau, of have access to the credit history of clients), compared with MFIs operating in countries without credit bureaus.

One major challenge in analyzing cost structures of MFIs in different countries is that we do not have good proxies for the costs of inputs. In particular, since the main component of OER is personnel expenses, the challenge is that we do not have a good proxy for salary levels for the skills needed to run a financial institution. In an attempt to fill this gap, we include prices of other inputs that are related

Explanatory variables considered in the original paper

MFIs Characteristics:

Lending Methodology (Individual, Village Banks, Solidarity Groups), Legal Status (Licensed, NGOs, Rural Banks, Credit Unions/Coops), Average Loan size per borrower/GNIPC, Borrowers/Staff, Age, GLP/Assets, Savings/GLP, Number of borrowers, and Number of Offices.

Physical Infrastructure and density of target population:

Electricity Production per capita, Electricity Outages, Roads Paved (percent), and Total Density of Population.

Financial Infrastructure (institutional):

Credit Bureau (both public and private)

Price and availability of inputs:

Internet Bundle/GNIPC, Residential Phone Line/GNIPC, Literacy rates (percent total population).

Doing Business (time and cost)

Insolvency resolution (years), Payment of Taxes (hours), Enforcement of Contracts (days), Business Start up/GNIPC

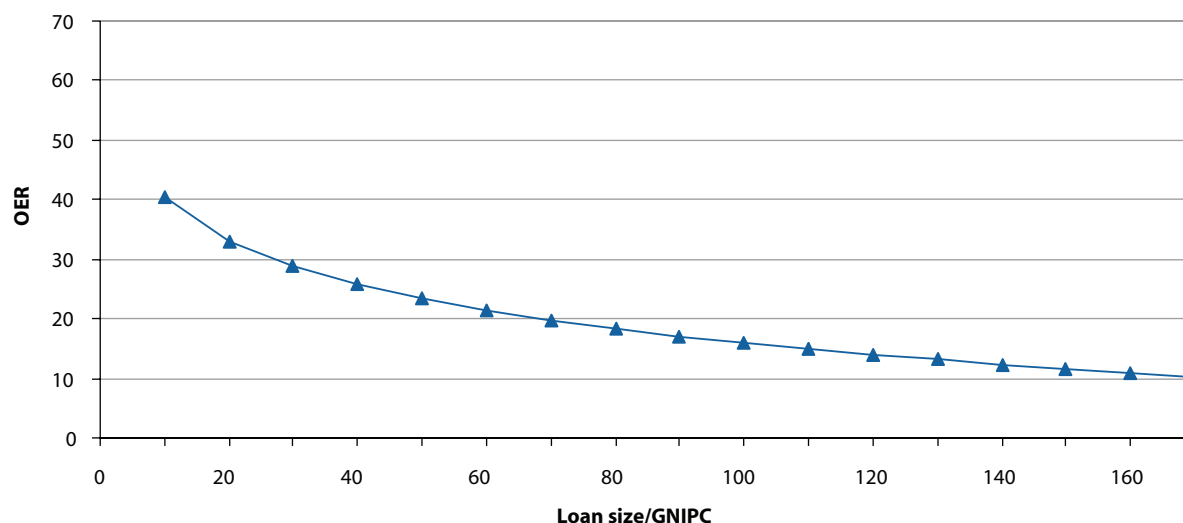
Macroeconomic Environment

GNIPC, Growth Rate of GNIPC, Lag Growth Rate, Inflation, Lag Inflation, Financial Depth.

Financial Infrastructure (physical)

ATMS/population, ATMS/surface, Branches/population, Branches/surface. These variables are measure at the country level for all regular banks, not at the MFI level

Predicted Effects for Loan Size / GNIPC



with operating expenses (like telecommunications) and that, at the same time, may be correlated with the cost of labor. In addition, to control for the availability of quality labor, we include literacy rates as one of the explanatory variables. Our hypothesis is that OER is going to be higher in countries where inputs are more expensive, or in countries where smaller proportions of the population are literate. In addition, we control for differences in GNI per capita in all regressions.

Business environment is an important element determining how easy is to do business in different countries. Most likely, we would expect that MFIs in countries where it is easier to do business have lower costs than MFIs in countries where it is more difficult to do business. In particular, from all the variables available in the Doing Business Report, we focus on those related more to the provision of financial services, or that could capture some of the input price effects.

To control for differences in the macroeconomic environment of the counties in the sample, we add as explanatory variables GNI per capita, inflation and financial depth. In addition, following up on the finding that defaults are not correlated with growth rate of GNI per capita (MIX Discussion Paper No. 1), we test whether lags of these variables have any significant correlation with OER. And finally, with the only goal of quantifying correlations with other relevant variables associated with financial infrastructure we use indicators for number of ATMs and bank branches per country (not per MFI).

Main results³

Based on the analysis of MFI characteristics, the three main drivers of OER are relative loan sizes, ages and scale. However, we are surprised by how quickly reductions in cost disappear after MFIs grow beyond 2,000 borrowers.

Another surprising result is the link between financial infrastructure, in particular credit information systems, and a significant and strong reduction in costs of licensed MFIs in countries with such facilities. Also, we found a significant relationship between OER and the cost of local inputs, in particular fixed telephone lines. This confirms that local conditions play a significant role in determining the cost structure of MFIs, but more research (in particular new explanatory variables like prices of other inputs) is necessary.

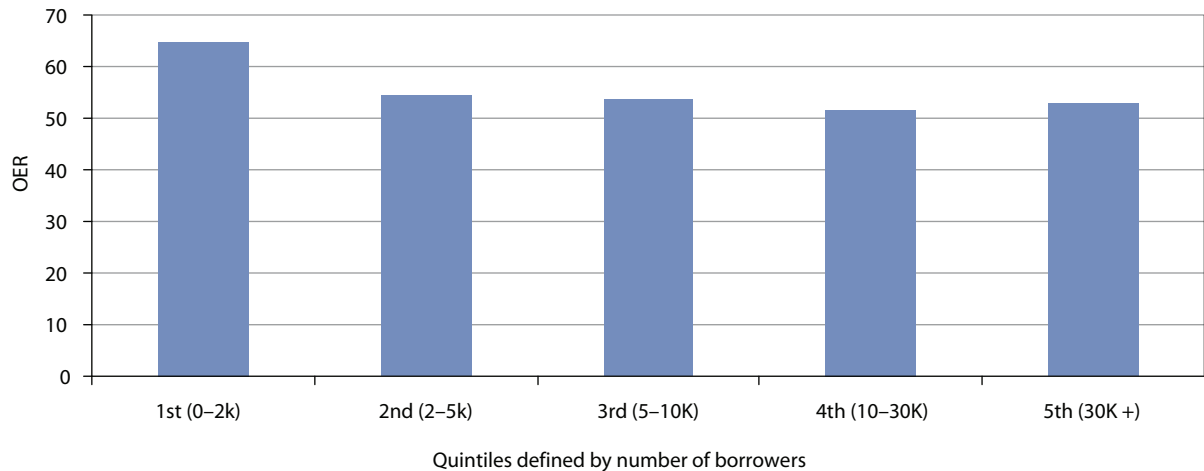
MFIs Characteristics

Regarding MFI characteristics, the three main drivers of costs are average loan size relative to GNI per capita, age of the MFI, and GLP relative to assets. Scale plays an important role explaining cost differences for MFIs smaller than 2,000 borrowers, but surprisingly we did not find additional reductions in costs for larger MFIs.

In particular, the predicted relationship between relative loan size and OER is statistically significant and strong, but decreasing for larger loan sizes as

³ In this section we summarize selected results with the highest influence of OER. For a full discussion of all results please see the original paper.

Predicted Effect for Scale



expected. For example, as depicted in the following graph, an increase in the relative loan size from 10 to 20 percent of GNIPC (GNI per capita) is expected to reduce OER over seven percentage points, but an increase in relative loan size from 30 to 40 percent (just around the median) is expected to reduce OER just around three percentage points.

We also found that, on average, older MFIs tend to have lower OERs. However, this relationship weakens over time. For example, for MFIs younger than six years, aging one year is expected to reduce OER between two to eight percentage points per year, but for MFIs younger than 11 years old, aging one year is expected to reduce OER between one to two percentage points per year, and for older MFIs, aging one year is associated with an average reduction in OER of less than one percentage point per year.

We also control for the percentage of assets that MFIs allocate as loan portfolio. Young MFIs and fast growing MFIs tend to have higher reserves (idle assets) to finance their future growth than mature MFIs or MFIs with limited access to external resources. In addition, "credit-plus" MFIs (like those with additional programs beyond credit, like education or health), tend to have a lower ratio of GLP to assets, and a higher OER as well. This is a strong relationship with an average decrease in cost of almost seven percentage points for every 10 percentage point increase in the ratio of GLP over Assets.

We also tested whether larger MFIs have lower OERs than smaller MFIs. For that we divided MFIs by quintiles according to number of borrowers and found that MFIs with more than two thousand borrowers have an

average OER 11 percentage points lower than smaller MFIs. However, and quite surprisingly, we did not find any evidence suggesting additional reductions in costs once MFIs grow beyond 5,000 borrowers (third quintile). For example, compared to the first quintile, we expect a reduction in cost of only 12, 13 and 12 percentage points for MFIs in the 3rd, 4th and 5th quintiles.

We found that the relationship between OER and borrowers per staff is statistically significant, but not very strong. Our results also confirm the fact that mobilizing voluntary savings is associated with higher OER. However, the increase in costs is not as dramatic as expected. Finally, after controlling for all explanatory variables included in the regression analysis, we did not find any significant correlation between the number of offices per MFI and the average operating expense ratio.

Physical Infrastructure

We did not find any significant relationship between OER and electrical outages (days). However, contrary to what we expected, we found a small, positive and significant relationship between electricity production per capita and OER (0.5 percentage points for every 100kwh per capita). Most likely, this is capturing effects associated with the level of industrialization and development of the country, where MFIs in more developed/industrialized countries have higher cost structures.

In addition, in the specifications where electricity per capita is one of the explanatory variables, we found a small, negative and significant relationship

between percentage of roads that are paved and OER (a reduction of 1.5 percentage points for every 10 percentage point increase in roads paved). Finally, in the same specifications we found some significant (but miniscule) relationships between OER and population density.

Credit Information Systems and OER

We also test whether the presence of credit information systems (both public and private) have any influence on OER. Caution should be used when interpreting these results because we are not measuring access to the credit bureau, since the information available does not distinguish for direct access of the MFI to the credit bureau. Using this information, we found that, on average, MFIs in countries with credit bureaus have an OER five percentage points lower than MFIs in countries without it. Since we are not controlling for direct access and reporting to the credit bureau, this result suggest that the credit bureau variable is partially capturing elements of the environment that make microfinance operations more efficient in these countries.

However, in order to test whether these general effects are associated with particular institutional types, we estimate additional models where we isolate the effect for two types of MFIs: licensed (banks and NBFIs that mobilize savings) and NGOs. We found that the OER of licensed MFIs in countries with credit bureaus is six percentage points lower than that of licensed MFIs in other countries, but we did not find a significant difference between the cost of NGOs in countries with credit bureaus versus NGOs in other countries. This suggests the reductions in costs for licensed MFIs is most likely associated with some form of access to the credit bureau and client information, thereby reducing efforts in screening borrowers, and collecting and enforcing contracts due to the value that borrowers put on their reputations and future access to credit.⁴

Prices and Availability of Inputs

We found that there is a significant relationship between the relative cost of a residential fixed phone

line (as percentage of GNIPC) and OER. In particular, we found that an increase of one percent of GNIPC in the cost of a fixed line is associated with an average increase of three percentage points in OER. We also try the relative price of internet bundle (relative to GNIPC), but the magnitude of the results was smaller and not always statistically significant.

Doing Business Environment

For licensed MFIs, we found a very small and significant relationship between the time to file taxes (hours) and OER. But contrary to our expectations, it was negative, suggesting that licensed MFIs in countries where it takes longer to prepare and pay taxes are more efficient than licensed MFIs in other countries. We are puzzled by this result, and given its low magnitude, it is probably noise.

With respect to the other business variables, we did not find any statistically significant relationship for: cost of enforcing contracts (as percentage of GNIPC), time required to enforced a contract (days), cost to register a business (percent GNIPC), and time to resolve insolvency (years).

Macroeconomic Factors

Surprisingly, we did not find any significant relationship with all macroeconomic variables considered, with the exception of lag growth, but the coefficient was only -0.2 for every one percentage point change in the lag growth rate. This means that MFIs are quite resilient to shocks: as we have shown in MIX Discussion Paper No. 1, portfolio quality and efficiency levels are not affected.

Correlation with Financial Infrastructure (Physical)

We did not found any significant correlation between the number of branches (per capita, and per square kilometer) and OER. However, we found a positive correlation between OER and the number of ATMs per square kilometer (an increase in OER of 0.4 percentage points for every ATM per square kilometer, and an increase in OER of 0.9 percentage points for every ATM per 100,000 inhabitants). Our interpretation of these results is related to the rates of substitution between labor and capital in the provision of financial services. In countries where the relative cost of ATMs is higher than the cost of labor, it is expected to have very low penetration of ATMs (because it is cheaper to hire more staff), but in

⁴ It has been suggested that credit bureaus will have a higher influence on the performance of individual loans, mainly through improvements in repayment and efficiency. However, since most licensed MFIs in the sample are individual lenders, the previous analysis is still valid.

countries where labor is more expensive compared to the cost of ATMs, it is expected to observe a higher ratio of ATMs to staff. For example, case studies of technology adoption in India suggest that a far cheaper alternative to electronic data transfer is to physically transport hard copies between branches of MFIs by bike carrier, even those branches as far as 20 kilometers away.

Future Research and Final Comments

Many important variables with a high influence on the cost levels of MFIs were not considered in this analysis because data is not available. Some of them are MFIs characteristics including technology use and management information systems, management quality, vision (commitment to efficiency), introduction of new products and services, actual use of credit information systems, and population density in service area. Others are country characteristics such as cost of human

resources and energy, and regulatory framework and other enabling environment factors.

Many results from this paper have important implications for policy makers. The fact that higher costs are associated with smaller loans should cause policy makers to retract from imposing interest rate ceilings, because they will hurt first those MFIs that serve the poorest borrowers. Also, policy makers dealing with young microfinance sectors, and probably lower levels of efficiency, may expect important reductions in costs in the first five to 10 years of operations, but slower reductions in cost for older MFIs. Finally, these results suggest that apparently the microfinance industry has been overestimating the benefits from growth and scale as a strategy to improve efficiency. There are two probable explanations. One is that new technologies have still to be designed to help large MFIs take advantage of their scale. The other explanation is that these technologies exist, but large MFIs have not adopted them yet. This is a puzzle that we cannot solve, but with important implications for the future expansion of microfinance services around the world.

Glossary of Abbreviations

GLP	:	Gross loan portfolio
GNI	:	Gross national income
GNIPC	:	Gross national income per capita
OER	:	Operating expense ratio