The Impact of Microfinance on Sales of Informal Small and Medium-Sized Enterprises: The Case of Peru

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Abstract

In the past several years, there has been increasing interest in the use of microcredit as a tool for improving the lives of the poor. The underlying idea is to support the business enterprises of the world's low-income and small-scale entrepreneurs by providing them with access to loans on reasonable terms. As one of the fastest growing economies in Latin America, Peru has the world's best business and policy environment for microfinance. However, little has been done to quantify the impact of microfinance on profitability and revenues of informal small and medium-sized enterprises. This paper reports on the findings of a survey conducted in two urban cities in Peru by the World Bank's Informal Enterprise Survey (IFS), and reflects on the potential benefits of microfinance as a source of not only anti-poverty development finance, but also as a key driver of sales.

Key words

Microfinance - Borrowing and saving activities carried out by people with few resources who borrow or save small amounts of money to usually undertake small business activities or increase their consumption.

SMEs – Small and Medium-Sized Enterprises

MFIs – Microfinance Institutions

SUNAT – Superintendencia Nacional de Administración Tributaria. For the purpose of this study, informal firms are defined as those not registered with the SUNAT.

Soles – "Short-hand" for Peruvian Nuevo Sol, the currency of Peru (USD\$ 1 = 2.58 soles)

I. Introduction

This paper analyzes the impact of microfinance loans on productivity and growth of Small and Medium-Sized Enterprises (SMEs) in the complex, but fairly large informal sector of Peru. Financial markets in developing countries tend to be characterized by the inefficient allocation of goods and services: the demand for credit or saving options is often higher than the supply of these financial services. This is usually the case of poor people and small-scale entrepreneurs who have no access to credit because they lack the financial collateral that banks require in the event of default. That said, a poorly functioning credit market could hinder economic growth and development, particularly when a combination of imperfect information and high transaction costs are observed.

This situation is especially relevant for developing countries where a large amount of people's income lie under the poverty line, and thus are often excluded from the financial system. With no financial collateral to guarantee the repayment of the loan to the lender, poor people usually have no access to formal credit. Consequently, the lack of financing opportunities may lead to lower levels of consumption and investment, which at the end may result in a vicious circle or poverty trap. For instance, while SMEs in Peru represent 98% of all Peruvian enterprises, are responsible for 75% of the total employment and contribute to 40% of total GDP, only 7% of all SMEs have formal access to credit (Acevedo, 2007). When formal and good functioning financial systems fail, like in the Peruvian case, people have to look for other financing options such as microfinance, which can provide an alternative to the constraint faced by poor households and micro entrepreneurs.

Furthermore, to understand the evolution of microfinance institutions (MFIs) in Peru, one must look at the way in which MFIs have developed over time, have progressively dived into almost every sector of the Peruvian economy, and have, up until this point, become key sources of financing for micro entrepreneurs. Starting in the 1980s, national and regional NGOs established microcredit programs for self-employed men and women, particularly those working in commerce and services, which subsequently gave rise to entities specializing in microfinance (Pait, 2009). Today, a very dynamic microfinance industry has expanded throughout Peru, and has resulted in the integration of institutions and new investment partners into the financial marketplace. This has led to a broader scope of work and coverage, as well as financial outreach throughout the country that allows MFIs to dive into almost every economic and social sector of the country, including rural areas not previously served.

Ultimately, reflecting on the actual impact of microfinance on business profitability is crucial to understand why small-scale entrepreneurs are increasingly opting to finance operations using microcredit, and from there, move on to develop a model for how such microfinance initiatives affect sales in the context of Peru. By examining the literature, Section II aims at developing a framework to better understand why credit markets have been historically associated with increased business profitability and entrepreneurial development, and how having access to micro loans can potentially lead to an increase in sales. This section will also address the argument behind microfinance, particularly in the context of developing countries. Section III, will describe the data used in this analysis, followed by Section IV, which will focus on the method used to test whether or not microfinance has an impact on sales of informal SMEs in Peru. The concluding discussion suggests that even though pervious research and economic intuition coincide with the results obtained in this study that microfinance indeed leads to higher sales, one must be cautious when generalizing this inference to other situations and micro enterprises. Given that it is not feasible to utilize the standard methods of controlling for time variation and selection bias, the limitations posed by a cross-sectional dataset cannot guarantee the accuracy of the results.

II. Conceptual Framework

While microfinance programs aim to bring social and economic benefits to clients, the real challenge is to be able to quantify such benefits rigorously. Microfinance discourse often revolves around the reduction of poverty, but rather than giving cash to poor households, microfinance programs offer small loans to foster small-scale entrepreneurial activities, which would not be accessible or would be only available at very high interest rates (Rashid and Townsend, 1993). As a result, the emergence and expansion of microfinance reflects institutional innovations that greatly reduce the risk and cost of providing financial services to poor individuals, households, and micro-entrepreneurs (Morduch, 1997).

But, how great is the ultimate impact on micro-enterprises? While strong claims are made to expound the ability of microfinance to contribute to the reduction of poverty, only a few studies use sizeable samples and appropriate treatment/control variables to address the role of MFIs in promoting entrepreneurial development, and more specifically in how they impact sales. Given that the financing of micro entrepreneurs is a relatively new concept and that it provides a forum for discussion on how microfinance influences profitability, this study reports on the findings of a survey conducted by the World Bank's Informal Enterprise Survey (IFS), and reflects on the potential benefits of microfinance as a source of not only anti-poverty development finance, but also as a key driver of sales (Ahmed, 2002).

The objective of this section is to discuss why access to loans is expected to have an influence on sales, in the complex, but fairly large informal sector of Peru. The hypothesis tested in this paper is that microfinance has no effect on sales. The alternative hypothesis is that having access to loans from MFIs increases sales for beneficiary SMEs. However, the key aspect of this study is to assess what determines the rational choice of SMEs in seeking access to microfinance, and how this in turn translates to increased sales. To do so, this section looks at previous literature to understand the potential link between microfinance and sales, while focusing on the historical background of micro enterprise development, informality and microfinance in Peru, and the logic behind the use of microfinance over other sources of financing.

Peru Context

Over the last decades, Peru's economy has experienced major crises and undergone structural adjustments, resulting in profound impacts on the population. Between 1997 and 1999, entrepreneurs in Peru faced recessionary conditions as the Peruvian economy suffered several severe shocks (Dunn & Gordon, 2001). These conditions combined to create an extended period of economic contraction and low internal demand, which translated into low sales and low profits in the microenterprise sector. As a result of and in spite of this difficult environment, microenterprises became an important alternative to scarce, low-paying informal sector employment. These enterprises, which generally employ only a single entrepreneur or an entrepreneur and one or two unpaid family members, provide a substantial percentage of Peru's overall employment and have helped households not only to survive, but also to accumulate assets and improve their economic circumstances.

In addition, although the scope and extent of the informal sector varies from country to country, the importance of informality across Latin America is very wide. In the case of Peru, it has been calculated that in general terms the informal sector accounts for 35% of gross domestic product (GDP) and 60% of man-hours worked (Barragan, 2005). That said, analyzing the role of microfinance for SMEs in the

informal sector is both socially and economically significant. Since a vast percentage of the Peruvian population works outside of the law and cannot insure themselves against risk or acquire secure property rights, their long-run productivity suffers and is often contingent upon external factors to keep their businesses running. MFIs, hence, can play a crucial and decisive role in providing assistance to this sector.

Furthermore, given Peru's conducive regulatory framework and investment climate, the decision of SMEs to finance operations using MFIs over other sources of financing makes sense. As the fastest growing financial institutions in Peru holding approximately 30-40% of the borrowers in the Peruvian financial system, MFIs direct most of their credit toward micro-enterprise efforts as opposed to consumer credit. As a result, a very dynamic microfinance industry has expanded throughout the country, and has resulted in the integration of institutions and new investment partners into the financial marketplace. However, despite the potential of microfinance to make a difference in entrepreneurial development and productivity, it is important to first understand the economic rationale behind the emergence and use of microfinance over other sources of financing, and the allocation decision of funds by beneficiary micro entrepreneurs leading to increased sales.

The Economics of Microfinance

Microfinance discourse often revolves around the reduction of poverty, but rather than giving cash to poor households, microfinance programs offer small loans to foster small-scale entrepreneurial activities, which would not be accessible or would be only available at very high interest rates or with collateral as a requirement. The central question to assess the impact of microfinance on microenterprise development is to determine whether or not it is even feasible to quantify the benefits of microfinance on sales, and if the potential increase in sales is even meaningful to these micro entrepreneurs. In other words, what makes microfinance so popular among low-income households and micro enterprises?

In order to address the potential benefits of microcredit and its impact on sales, it is important to first consider the economic rationale behind the use of MFIs. Starting with credit markets, it is reasonable to state that there are many barriers to credit that arise when information asymmetry and high transactions costs are observed, which leads to issues of moral hazard and adverse selection. The problem of moral hazard may arise when individuals opt to behave in such a way that leads the borrower to believe that they are willing to take the burden of a loan and are committed to its repayment, when in reality that may not be the case. Another problem may be adverse selection, which occurs when high interest rates discourage people who are planning to repay, and encourage people who have low cost of default and were planning to default anyway.

That said, banks tend to mitigate the negative effects posed by imperfect information through the use of collateral, which serves as a protection for a lender against a borrower's default. By having financial collateral, the borrower signalizes that even in the worse case he/she will be able to repay his/her credit to the lender. At the same time, the risks of lending are reduced, which may induce the lender to charge lower interest rates. Nonetheless, poor households and small-scale entrepreneurs are usually excluded from the financial system because they lack financial collateral. This situation is especially relevant for developing countries where a large amount of people's income lie under the poverty line. Given that the poor need capital to start their businesses, the microfinance system responds to poor people's needs, which cannot be fulfilled by ordinary financial practices (Bond, 2002). This innovative banking

system is more effective than regular financial practices in solving a vicious circle of poverty because microfinance lends money to poor people, requires no collateral, and is willing to give small amounts of credit.

Literature Review

Empirical evidence and previous research on the topic have focused primarily on the various channels of investment that microfinance offers to entrepreneurs as a way to assess the impact that these funds have on profitability, revenues, and sales. Hypothetically speaking, such funds could be used towards hiring more staff, expanding the business facility, improving the infrastructure, and/or developing marketing and business strategies to ultimately increase both import and export markets, as well as to general sales for a wide variety of locally produced goods. The beneficiaries of microfinance may also opt to use the funds towards the purchasing of tools, machinery and equipment, in order to expand business production, and hence increase sales.

In a recent study on the views of entrepreneurs about their financial situation as a result of microcredit, most respondents reported not having substantially increased household expenses after obtaining the loan, while 100% said the impact was positive because it allowed them to have more working capital, assets and inputs. For these entrepreneurs, microcredit particularly helped them raise more revenue because these additional resources were used to increase working capital, allowing for larger inventories and the purchase of fixed assets and raw materials at lower prices per unit, which ultimately increased profitability (Rodriguez, 2010). A similar study found that microcredit appeared to have had positive impacts on microenterprise revenue in both the treatment and new entrant groups. Just as the previous study shows, the likely path by which these impacts occurred was through an increase in enterprise working capital, so that entrepreneurs were able to buy more inventory, secure lower input prices, and hence increase sales, which leads to larger profits (Dunn & Arbuckle, 2001).

Having access to credit also translates into two types of transaction relationships. First, microcredit helps entrepreneurs buy inputs in more advantageous ways. Client enterprises are more likely than their control group counterparts to change their main source of suppliers from retailers to wholesalers, saving money by buying inputs in bulk at lower prices. Second, microcredit can also help entrepreneurs gain ownership of their business premises (Dunn & Arbuckle, 2001). This is considered a positive impact because, if a premise is owned, the entrepreneur may have more incentive to improve it, does not have to spend revenue on rent, and does not have to fear eviction. With more capital in hand and full ownership of their businesses, micro entrepreneurs are more capable of expanding their businesses to areas not previously covered, and appeal a larger clientele through the use of marketing material. With a larger clientele, sales are in turn expected to increase.

Other studies have also found that beneficiary microenterprises provide on average more days of total employment per month and more days of paid employment per month than those businesses not receiving microcredit. The positive impact of microcredit on employment is relevant to macroeconomic policy in Peru, since microenterprises employ a significant proportion of the labor force. In addition, the creation of paid jobs could have the potential of not only expanding a business operating body, but also of boosting production of goods, in the case of microenterprises in which the final product is manufactured internally. With a high demand for such goods, a larger supply of products could then translate to higher sales and increased revenues.

III. Data

In order to quantify the benefits of microfinance and to determine the impact that it has on sales of beneficiary enterprises, this paper uses a cross-sectional dataset from the World Bank's Informal Enterprise Survey (IFS) collected in Peru from June 10, 2010 to July 20, 2010. The IFS collects data on non- registered business activities in every region of the world using a uniform sampling methodology in order to minimize measurement error and yield data that are comparable across the world's economies. The mode of data collection is face-to-face interviews and the primary sampling unit of analysis is an unregistered establishment. For Peru, informal firms were defined as those not registered with the Superintendencia Nacional de Administración Tributaria (SUNAT). The survey used in this study provides key information about the state of the private sector for informal businesses in Peru and generates information on the level of activity in the informal sector of selected urban centers.

The survey was implemented following a two-stage procedure. In the first stage, a screening procedure was conducted in order to identify eligible interviewees. At first a full description of all the activities of the business owner or manager is taken, based on its principal activity. Subsequently, a business is classified in the manufacturing or services category using a list of activities developed from previous iterations of the survey. As a general condition, services were identified as an "ongoing business enterprise", excluding the sale of manual labor. Manufacturing activity in the informal sector consisted of a business activity requiring inputs and/or intermediate goods. Once a business or activity was identified as eligible, willing participants were interviewed using a multi-topic questionnaire. The overall survey response rate among contacted eligible businesses was estimated at 25%, as respondents were either occasionally confused about the questions, or reluctant to give personal and/or sensitive business information to government officials.

Sampling Structure

The evaluation sample used in this study includes 480 microenterprises in 2 selected urban centers of Peru. The breakdown of the final sample for a total of 480 interviews was: 239 in Arequipa, and 241 in Lima, which were conducted in no specific order. Sampling was conducted within clearly delineated sampling zones, which were geographically determined divisions within each urban center according to the concentration and geographical dispersion of informal business activity. In order to provide information on diverse aspects of the informal economy, the sample was designed to have equal proportions of services and manufacturing (50:50). The most common activity was reported as manufacturing of clothes/shoes, while the least frequently mentioned activities were the manufacturing of tools and instruments, transport services, as well as cleaning and washing services.

For the purpose of this paper, the dataset provides key information that enables us to test the main hypothesis. Particularly concerning our dependent and independent variables, it includes a continuous variable for total sales of the business in the last completed month, and a dummy variable for whether or not the business financed day-to-day operations by using microfinance institution (Yes=1, No=0), respectively. The dataset also includes general and specific information about a business, such as infrastructure and services, sales and supplies, crime, sources and access to finance, business-government relationship, assets, workforce composition, obstacles to get registration, reasons for not registering, and benefits that an establishment could get from registration. This information is necessary for the identification of potential control variables that could also influence sales, and should be included in the final model. Failure to include such exogenous variables could threaten the validity

of the model.

Descriptive Statistics

A comprehensive description of the data available for analysis is used to check the observed differences in SMEs that financed operations using microfinance (treatment), and those that did not (control). The descriptive statistics for key characteristics are presented in Table 1. These key characteristics are often chosen on the basis of exogeneity; in other words, variables that are estimated to influence sales but not to be affected by microfinance. The main objective for identifying such exogenous variables is to avoid endogeneity bias, which occurs when the independent variable is correlated with the error term in a regression model, broadly a potential loop of causality between the independent variables. Failure to do so would imply that the regression coefficient in a regression would be biased.

Table 1 includes the means for the full sample, as well as for the control and treatment groups. For the control vs. treatment section of the table, the first column presents the mean of each variable for control SMEs, and the second presents the same for treatment SMEs. The third column presents the difference between the two, and the fourth provides the t-statistics for the mean difference between the two. Table 1 suggests that there are no statistically significant differences between treatment and control groups in terms of physical location, business location, number of owners, marital status of largest owner, and worker compensation. In terms of worker compensation, though no statistically significant differences were found, treatment SMEs reported a higher average monthly salary, with a worker from a treatment SME receiving an average monthly salary of 435.53 soles, in comparison to the control counterpart, receiving approximately 405.96 soles a month.

On the contrary, the results indicate that there are statistically significant differences between the control and treatment groups in terms of sales, geographical location, as well as age and education of largest owner. More specifically, mean sales reported by treatment SMEs were estimated to be 2,101.77 soles, compared to control SMEs, which reported roughly 1,817.08 soles. Though the difference between the two is 474 soles (USD183) and may not seem substantial, it is important to take into account that in monetary terms, treatment SMEs are making roughly 15% more in sales than their control counterparts. In analyzing the impact of microfinance on sales, one could imply that this difference is a result of participation in a microcredit program. In addition, there is a higher concentration of treatment SMEs in Lima than in Arequipa, and a higher concentration of control SMEs located in Arequipa than in Lima. As it will be discussed later, the downside of such geographical differences is that they could potentially threaten the validity of the model, and so controlling for these differences is crucial to avoid a potential bias.

The results also show that in terms of the age of the largest owner, the estimated average age in treatment SMEs is 47.68 years, while for control SMEs it is 43.03 years, a difference of almost 5 years. Such variations are important because age is often associated with experience, and so having a more experienced owner can be a determinant of higher sales. In addition, similar significant differences were found, in terms of the highest level of education attained by the largest owner and of whether or not the largest owner completed a vocational training or technical education. The results show that there are 23% more owners in treatment SMEs who have completed a vocational training or technical education attaining or technical education.

Overall, we see that the most prominent differences between treatment and control SMEs are in terms of sales, regional location, as well as age and educational level of largest owner. The main implication for the analysis is that sales may be driven by external factors not controlled for in the model, such as variation in characteristics inhibited by SMEs located in Lima, compared to those located in Arequipa. Understanding the differences between treatment and control SMEs is essential to determine if the sample dataset contains a reasonable counterfactual in which SMEs are not significantly different, and that analyzing the impact of sales would not be confounded by potential threats to validity resulting from differences between treatment and control SMEs

IV. Method

The purpose of this study is to identify the average effect of microfinance on sales in microenterprises that financed day-to-day operations by using microfinance institutions (the average impact of treatment on the treated). Specifically, the main focus is to compare sales, the dependent variable, when SMEs had access to microfinance, in contrast to the counterfactual, that is when SMEs did not have access to microfinance. To do so, this paper aims at developing a sufficiently specified and accurate model such that the estimated effects of microfinance on sales are unbiased. Unfortunately, the study relies on a cross-sectional dataset, and so it is not clear how well it can deal with selection bias. The limitations associated with a cross-sectional dataset often reflect the challenges of data collection in this area of research, and so it is key to point out the regardless of the accuracy and depth of the methodology, the validity of the final results remains at stake.

Understanding the Limitations of Cross-Sectional Research

A major concern is that SMEs that chose to finance daily operations by using microfinance institutions could be different from the SMEs that opted for other sources of financing or no financing at all, and that these differences may be correlated with sales. For instance, sales may be determined by the type of business activity, and not by the effect of having access to microfinance. In this case, the correlation between microfinance and sales would be confounded by the effect that a certain type of business activity may have on the dependent variable. In principle, many of the types of (unobservable) characteristics that may confound identification are those that vary across SMEs but are fixed over time. A common method of controlling for this unobserved heterogeneity is to use panel data and estimate differences between characteristics of key variables. In the case of a cross-sectional dataset, however, this approach is not possible and so the only viable option is to focus the descriptive analysis on exogenous variables that are not affected by MFI access in the short-run.

Another key challenge inherent in this line of research is the problem of low survey response rates. Response rates in the 20-30 percent range raise genuine questions about response bias. Even a comparison of population and sample means would not directly address the potential level of response or selectivity bias (Huselid & Becker, 1996). With a response rate of 25% for the dataset used in this study, the first impression is that most owners of SMEs that did not respond were either unsure about the question, or the question simply did not apply to their businesses. For the purpose of this study, the main approach was to opt for key variables with relatively high response rates, and hence avoid a considerable reduction of the sample size that can lead to misleading inferences. Thus, keeping in mind such sources of potential selection bias is key for the development of the model and the interpretation of the results to accurately predict the impact of microfinance on sales.

Furthermore, since a single cross-sectional data collection does not allow the analysis of change over time, whether at the *aggregate level* for populations or sub-groups, or at the *micro-level* for examining

individual change (like panel data can), it is not possible to impose time independent effects for each entity that are potentially correlated with the regressors. In empirical applications, a common problem is the presence of unobserved local or regional variables that may give rise to spatial error correlation. For instance, regional dummy variables for the various districts within Lima and Arequipa could control for potential differences among the districts. Spatial fixed effects are often used as variables for each spatial unit within each region to control for region specific effects not controlled for elsewhere. Though there some other ways to deal with spatial correlation, a recent study by Kuminoff et al. concluded that spatial fixed effects are clearly the preferable strategy for addressing spatially correlated omitted variables in cross-section data (2010, p. 148). The downside to this alternative is that when data to account for spatial differences within each region is not available, as in the case of this study, it is not possible to control for such unobserved variables

Building the Model

After having identified potential limitations that could induce bias and inconsistency in the estimation process, the focus now turns to the development of the model to understand, from a statistical standpoint, the impact of microfinance on sales of informal SMEs in Peru. In developing such model, it is important to control for other variables that could affect sales, such as those included in Table 1. The main purpose of holding those variables constant is to see if there actually is a relationship between microfinance and sales. When adding other variables to the regression, we are controlling for these new variables, by focusing on the impact of microfinance on sales, while taking into account other factors that may influence the dependent variable. The primary reason for doing so is to avoid leaving out important variables from the regression equation, which could lead to biased coefficients.

The starting point for the development of the model is to establish the dependent variable –*total sales* of the business in the last completed month - and the main independent variable – a dummy variable for whether or not the business financed day-to-day operations by using microfinance institution (Yes=1, No=0). Because our dependent variable (y), sales, is continuous, we use a linear regression model in which the y-variable will increase or decrease at a constant ratio to the independent variable. The model used in this study is known as the Ordinary Least Square (OLS) regression, a dominant method used in practice for regression analysis (Sotck & Watson, 2010). The validity of the model is contingent upon the clear assumption that all three of Stock & Watson's assumptions are true for the OLS linear regression model that: the error term has a mean of zero conditional on the regressor; the [X(i), Y(i)] observations are i.i.d. random draws; and large outliers are unlikely (2010).

Evaluating the impact of a microfinance program requires measuring the impact of receiving the program's services versus the counterfactual of not receiving the services. To understand the effect that the main independent variable has on the dependent variable, the model is described as:

$$Y_i = \alpha_i + X_i\beta + Z_i\lambda_i + \varepsilon_i$$

where Y_{ij} is the dependent variable for enterprise *i*; α is a constant that represents the value that *Y* is predicted to have when all the independent variables are equal to zero; X_i is the independent variable used to predict the dependent variable; β is the coefficient that describes the size of the effect the independent variable is having on the dependent variable Y; and $Z\lambda_i$ is bolded to denote a matrix of all the control variables included in the model, where Z is the vector of control variables and lambda are the estimated parameters. The standard error, or error term, ε_i , captures all other factors that influence the dependent variable other than the regressors, as well as the heteroskedasticity inherent in the model. In this regression, exogenous variables are included as controls because they have been estimated to be predictive of sales outcomes and, as a result, improve the precision of the impact estimates. When running the regression, the main objective is to discover whether the coefficient on the independent variable is really different from 0 (so the independent variable is having a genuine effect on the dependent variable) or if alternatively any apparent differences from 0 are just due to random chance. The null hypothesis is that the main independent variable (microfinance) is having absolutely no effect on sales (has a coefficient of 0) and so the main objective is to find a reason to reject this theory.

Since the regression includes one main independent variable and multiple control variables, the coefficient indicates how much the dependent variable is expected to increase when the independent variable increases by one, holding all the other control variables constant. It is very important to keep in mind the units, which the variables are measured in, and whether they are continuous, discrete, or dummy. On a side note, though the R-squared can be a good indicator of the variation in the dependent variable that is accounted for, or predicted by, the independent and control variables, the R-squared in this case is of secondary importance since the regression equation is not being used to make accurate predictions. This is mainly due to the limitations posed by a cross-sectional dataset, the low response rates, the failure to control for spatial and time variations, as well as not having sufficient data to include instrumental variables to address the issue of reverse causality, which occurs when the dependent variable causes at least one of the independent or control variables.

V. Results

As previously stated, this paper estimates an OLS regression model of the impact that microfinance has on sales. The results, illustrated by Table 2, show that having access to microfinance leads to an increase in sales of 1,223.01 soles (or approx. USD473) per month, however the results are only marginally significant at the 10% level and so one must be cautious when generalizing inferences to other situations and to other microenterprises. Generally speaking, there is evidence that having access to microfinance impacts sales; however the relationship is not strong. The major constraint is that with only 480 observations in play, it is hard to get the desired and commonly used significance level of 5%. In addition, an evident loss of validity comes from the fact that this analysis employs a sample with no variation in time. Because of the limitations posed by a cross-sectional dataset, one cannot be sure that the conclusions drawn about cause-effect-relationships do actually apply to microenterprises in other geographic locations or without the features of the surveyed SMEs.

Nonetheless, going back to the description of the sample dataset, a treatment microenterprise earned on average 2,101.77 soles a month; therefore the increase in sales originated by the treatment represents roughly 58% of total sales reported by the treatment group, which is highly significant in monetary terms. Moreover, the difference between the mean values of the treatment and control SMEs was roughly 475 soles, which indicates that the estimated increase in sales from having access to microfinance could be a determinant of the higher amount of sales reported by treatment SMEs. Though this assumption does not, in any way, imply that microfinance plays a decisive role in the difference of sales among businesses that received the services and those that did not, it is important to point out that when comparing the estimated variation in sales to the mean value of the treatment, the increase in sales is economically significant.

The results also show that both the regional and physical location of the business have a positive impact on sales. For instance, if the business has a physical location, sales are expected to increase by roughly 677 soles (or approx. USD262) per month, compared to those businesses with no physical location. In addition, if the business is located in the capital of Lima, rather than in Arequipa, sales are expected to increase by 695 soles (or approx. USD269) per month. Since these results are significant at the 5% level, this raises a key question regarding the need to control for geographic variations across entities. For instance, microenterprises located in Lima could be in advantage compared to those located in Arequipa, since one may argue that being located in Lima implies a higher number of MFIs and thus easier access to microfinance services. In addition, a more populated area such as Lima could contribute to a higher demand for goods and a subsequent increase in sales. Failure to include spatial fixed effects can lead to biased results since such geographical differences among SMEs are not accounted for.

Literary Evaluation

Expectations about the impact of microfinance on sales are mainly based on the use of economic intuition and empirical evidence from previous articles in which a similar analysis was conducted, preferably from the same country of study. In a broad sense, the results found in this paper coincide with the various impact assessments previously performed on the subject of microfinance and microenterprise profitability. For instance, in a paper using a panel dataset from a Peruvian microfinance institution to provide evidence of the benefits of microfinance, the author found that an average micro entrepreneur who borrows, earns enterprise profits of 101 soles/week or 270 soles/month more than one who does not borrow (Tedeschi & Karlan, 2001).'

A second study in Peru conducted by USAID's AIMS Program suggested an increase of USD372 in net annual enterprise revenue, and a USD377 rise in household income, per year of credit receipt (Tedeschi, 2008). In addition, a third study by Dunn and Gordon shows that for several key variables, including enterprise revenue, enterprise fixed assets, business premise ownership, and business licensing, increased time in the microcredit program was associated with better outcomes on all these variables (Dunn & Gordon, 2001). The inferences drawn from Dunn and Gordon's paper reinforce the importance of controlling for variation in time since the longer a client has been participating on a microfinance program, the larger the benefits reported across microenterprises. Though previous literature has proven that the outcomes of this model are in line with what other researches have concluded when analyzing the impact of microfinance on sales, the use of a panel data could help predict a much more credible analysis than one based on cross-sectional research.

Finally, generalizing the results of the impact of microfinance on sales is fraught with danger given large variation in types of service or sources of funding available to clients, socio-economic characteristics of users, geographical differences across SMEs, and the level of methodological accuracy. This paper concurs with other reviewers in concluding (from theory as well as evidence) that having access to microfinance is estimated to increase sales of informal SMEs. Nonetheless, microfinance can vary widely in different contexts. It should be no surprise, for example, that restoring access to credit for experienced entrepreneurs early in the recovery phase of countries that have experienced severe economic stagnation can have dramatic positive effects on their business activity and income. On the contrary, microcredit can result in severe over-indebtedness due to exorbitant interest rates, especially if driven by speculative bubbles about the extent of unmet demand, as recently experienced in the crisis of non-banking financial institutions in Southern India (Copestake &

Williams, 2011). Hence, this paper concurs that despite having estimated the impact of microfinance on sales, the results must be interpreted as a small piece of growing body of knowledge about how microfinance really works, given pre-determined and changing circumstances.

VI. Conclusion and Policy Recommendations

This paper has analyzed the impact of microfinance on informal SMEs in Peru, compared to those microenterprises that did not finance operations using MFIs, or opted for other sources of financing. When formal and good functioning credit markets fail for low-income people and small-scale entrepreneurs, people have to look for other financing options such as microfinance, which can provide an alternative to the constraint faced by poor households and micro entrepreneurs. As a result, this paper first assessed the underlying premises behind credit markets and how they fail to address the needs of the poor, and then moved onto explaining why microfinance aims at mitigating the problems of lack of collateral. By examining the context of Peru, the economics of microfinance, and the allocation decision of funds by beneficiary micro entrepreneurs, as a preliminary framework to analyze the results, this study focused on the motives behind SMEs for choosing microfinance over other sources of financing and how these micro loans ultimately translate into increased sales.

The evidence suggests that by having access to microfinance, clients can consistently improve enterprise performance and increase sales. Overall, the results show that microfinance increases sales of SMEs in Peru and so the null hypothesis that microfinance has no effect on sales is rejected at the 10% level. The main issue is whether the model is truly capturing the effects of microenterprise and not something else such as the type of firm that gets access to microcredit or the regional differences across SMEs. An evident loss of validity comes from the fact that this analysis employs a small sample of only 480 observations and with no variation in time one cannot be sure that the conclusion drawn about cause-effect-relationships actually applies to microenterprises in other geographic locations or without the features of the surveyed SMEs. That said, future research on the topic should seek to include time variation, and preferably conduct the analysis using a panel dataset.

However, when analyzing the actual magnitude of the results, it is plausible to state that having access to microfinance does allow micro entrepreneurs to significantly increase sales compared to their control counterparts. After carefully considering the limitations posed by the cross-sectional dataset used in this analysis, the results showed that having access to microfinance leads to an increase in sales of 1,223.01 soles (or approx. USD473) per month. Since a treatment SME earned on average 2,101.77 soles a month, this estimated increase in sales represents roughly 58% of total sales reported by the treatment group, which is highly significant in monetary terms. Moreover, though the difference of sales between the two groups is 474 soles (USD\$83) and may not seem substantial, treatment SMEs are making roughly 15% more in sales than their control counterparts. That said, when analyzing the impact of microfinance on sales, one could imply that this difference is a result of participation in a microfinance program.

Policy Recommendations

Given that the results show that microfinance increases sales on treatment SMEs compared to their control counterparts, and that there is enough evidence to conclude that in monetary terms, the estimated increase is highly significant and has the potential to benefit beneficiary SMEs, governments should focus on promoting microfinance for poor households and small-scale enterprises that do not have access to credit. To help micro-entrepreneurs increase sales and profitability, governments should

also implement programs that focus more specifically on expanding access to local and international markets through relationship building, research and strategic development. Though this study did not take into account the role that other factors such as education play in determining the impact on sales, it is important to note that along with programs to encourage the use of microfinance for SMEs, governments may also opt at directly assisting entrepreneurs in gaining knowledge of how to manage their businesses optimally (Karlan & Valdivia, 2010).

Appendix

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		Full S	Full Sample Control vs. Tr			Treatment	
Variable	Obs (N)	Mean	Std. Dev.	Control SME (I)	Treatment SME (II)	Difference III=(II-I)	T-stat.
Sales	478	1,894.2 3	2,673.77	1,817.08	2,101.77	473.68	2.29** ¹
Geographical location (Lima=1, Arequipa=0)	478	0.50	0.50	0.76	0.48	0.29	3.26***
Physical location (Yes=1, No=2)	478	0.21	0.41	0.21	0.18	-0.04	-0.49
Number of owners	478	1.08	0.35	1.07	1.09	0.01	0.22
Year business started	478	1996.11	92.41	1995.91	1998.71	2.80	0.17
Owner Characteristics:							
Age	478	43.35	12.56	43.02	47.68	4.66	2.09**
Marital status	478	1.86	0.58	1.86	1.82	-0.04	-0.36
Size of household	478	4.23	1.98	4.20	4.56	0.36	1.02
Highest level of education	478	3.25	0.84	3.23	3.53	0.30	2.05**
Vocational/ technical education (Yes=1, No=0)	478	0.54	0.50	0.55	0.32	-0.23	-2.61**
Location of business (within household=1, outside of household=0)	478	0.77	0.42	0.77	0.76	-0.01	-0.07
Crime-related losses (Yes=1, No=0)	477	0.89	0.31	0.89	0.82	-0.07	-1.26
Average monthly salary	477	408.07	213.27	405.96	435.53	29.57	0.78

- 1 star (*) signifies that the coefficient on the given variable is statistically significant at the 10% level
- 2 stars(**) signify that the coefficient on the given variable is statistically significant at the 5% level
- 3 stars(***) signify that the coefficient on the given variable is statistically significant at the 1% level

¹ The star notation is in line with the following academic convention:

⁻ No star signifies that the coefficient on the given variable is not statistically significant at either of the three levels.

Table 2: OLS Regression Results

Variables	Obs.	Coef.	P-value
Microfinance (Yes=1, No=0)	478	1,223.01	0.068^{*2}
Geographical location (Lima=1, Arequipa=0)	478	695.12	0.018**
Physical location (Yes=1, No=0)	478	677.20	0.022**
Number of owners	478	527.73	0.078*
Year business started	478	0.42	
Age of largest owner	478	-15.39	0.191
Marital status of largest owner:	478		
Married or Partnered		408.83	0.116
Divorced or Widowed		255.68	0.555
Size of household of largest owner	478	31.99	0.583
Highest level of education of largest owner	478		
Primary Education		-198.24	0.743
Secondary Education		-51.51	0.934
Vocational Education		177.50	0.808
University Education		-541.89	0.420
Completion of vocational or technical education (Yes=1, No=0)	478	-42.68	0.903
Location of business (within household=1, outside of household=0)	478	4.48	0.986
Crime-related losses (Yes=1, No=0)	477	-83.12	0.575
Average monthly salary	477	3.32	0.000***

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