IMPACT OF MICROFINANCE ON POVERTY, INCOME INEQUALITY AND ENTREPRENEURSHIP

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I. Introduction

The term "Microfinance" pertains to the lending of extremely small amounts of capital to poor entrepreneurs in order to create a mechanism to alleviate poverty by providing the poor and destitute with resources that are available to the wealthy, albeit at a smaller scale. This particular form of lending has existed in the world for quite some time, though formalized by Mohammed Yunus in Bangladesh during the 1970's. Yunus won the Nobel Peace prize in 2006 for his efforts in combating poverty and providing resources to the poor via the Grameen Bank and the microfinance model.

Historically, microfinance has existed among the poor in various shapes and forms. The most common example cited is that of a rotary club, wherein people pool their savings into a certain fund every month, and then are randomly picked (without replacement) to receive the entire fund every year. This method required, of course, that each member of the club belong to a tightly knit social circle in order to be trusted and thus, allowed to participate. This "pooled savings" method of financing has been quite popular in various cultures across the globe. Furthermore, there have existed informal lending institutions extending credit to the poor and vulnerable, though on very strict and often extraordinary terms.

Today, microfinance institutions (of which the Grameen Bank is the pioneer, but many other institutions have also joined the market) allow for both the "pooled savings" model as well as the small lending using favorable terms. The concept is simple, loan small funds to the poor (usually under 10 USD) for a small fixed period of time, and thus the individual is able to access further lending at points of repayment or thereafter. This would tend to empower would-be entrepreneurs to take up a trade and allow them to start earning and thus to provide their families with income stability. For the purpose of this analysis, the latter model of microfinance is

assumed. Women are actually favored by this form of lending, since it is seen (on average) that the repayment rates of women are actually higher than that of men. However, this research proposal attempts to generalize the finding to include the poor overall, and attempts to make no distinction in the demographics of the microfinance recipients. Furthermore, this proposal focuses solely on developing countries (as defined by the World Bank at the time of this analysis). This is done to ensure the data is collected on the individuals most in need of microfinancing opportunities.

The purpose of this research proposal is to identify and explain if, in the past three decades wherein microfinance has taken place, there are any significant impacts on poverty and inequality in the applicable regions. Furthermore, as the growth in aggregate microfinance loans have increased, is there a direct relationship with growth in entrepreneurial activities? In other words, has the advent of microfinance enabled entrepreneurs to increase their activities?

The following three hypotheses are proposed to be tested by the research design:

1. With a higher amount of microfinance lending, poverty will decrease.
2. As a result of a decrease in poverty due to higher amounts of microfinancial lending, income inequality levels can also be expected to decrease.
3. Countries with higher amounts of microfinancial lending will experience higher levels of entrepreneurship activity over time. As a result, both poverty and income inequality can be expected to be negatively impacted.

II. Literature Review

Microfinance has enjoyed a wealth of literature in the past, and is quite often seen as one of the most significant tools developed (in recent history) to combat poverty at the grassroots level. This proposal focuses on five selected studies in order to survey a representative sample of literature addressing issues faced by the formal microfinance sector. Today concerns are abound regarding the sustainability of the microfinance enterprises, specifically because of the nature of the lending itself. Loans are constantly being made to high-risk low income individuals, with unique and innovative methods being utilized to create re-payment incentives. Thus, the most significant concern at the moment is whether the formal microfinance institutions are actually impacting poverty in a significant manner. It is with this idea in mind that the literature was selected.

II.1 Research Purpose and Hypotheses

The overall purpose for the selected literature is to evaluate the effectiveness of microfinance in various dimensions. Loosely stated, the goal of microfinance is to reduce poverty, however the authors focus on the mechanism by which poverty is reduced. Amin et al (2003) focus their article on the ability of microfinance to reach the poor and vulnerable. They focus their article in such a manner because of concerns that microfinance is only serving people slightly above or below the poverty line, however the really poor and destitute are being systematically excluded. By contrast, Copestake et al (2001) analyze the impacts of microfinance on firms and individual wellbeing. Copestake focuses on business performance and household income to establish a link between the availability of microfinance and overall wellbeing of the poor.

Evans et al (1999) approach the microfinance question at a slightly different angle however. They seek to explain nonparticipation in the microfinance revolution, stating that while

microfinance is used as a viable tool in fighting poverty, more than 75% of the poor individuals choose not to participate for various reasons. Kabeer (2001) provides a meta-analysis of microfinance and focuses on women empowerment, intending to show why various studies conflict in their conclusions as to the impact of microfinance on women empowerment. Finally, Park (2001) evaluates the actual microfinance programs in China using 3 key measures (targeting, sustainability and overall impact).

Of the literature surveyed, analysis of Park (2001) is the most relevant as far as this proposal is concerned since they chose to focus on the overall impacts of microfinance, as opposed to the minute aspects of the financing model. That being said, however, the approach taken by Amin et al (2003) is quite strong in that it seeks to figure out if the model is making a more than marginal impact on poverty.

The research hypotheses are as follows:

1. Amin et al (2003). How effective is the availability of microfinance for the poor and vulnerable?
2. Copestake et al (2001). Estimate the impacts of microfinance programs on business performance and individual wellbeing.
3. Evans et al (1999). Analyze barriers to entry in microfinance programs as reasons for nonparticipation.
4. Kabeer (2001). Conduct a meta-analysis to explore the reasons for conflicting outcomes in the impact of microfinance on the empowerment of women.
5. Park (2001). Evaluate the effect of microfinance on poverty via targeting, sustainability and impact.

II.2 Research Design Types

Based on the surveyed literature, the most popular design for analyzing microfinance is the Longitudinal Design, specifically a Cohort Design that is prospective in nature. All the authors utilize survey instruments in conducting their research. Copestake et al (2001), Evans et al (1999) and Park (2001) each formulate a Cohort design, though they differ in the shared characteristics of the cohorts. Copestake et al (2001) identify their cohorts based on the microfinance participation levels of the survey respondents. Evans et al (1999) identify their cohorts by their level of wealth, and Park (2001) identify their cohorts by the level of governmental involvement in the chosen microfinance lending institution (please see section II.4 for a detailed discussion of the cohort groups). In addition, Evans et al (1999) utilize a "cascading set of qualitative focus group discussions and key informant interviews" in order to lend a qualitative approach to their research. Amin et al (2003) utilize Quasi-experimental Time Series Design for their research. They collect their sample from two villages in Bangladesh and follow the respondents over two years. Kabeer (2001) conducts a meta-analysis on a variety of research where the most common method utilized is the Cohort Design as well; most of the articles identify their cohorts as the gender of the head of household, making distinctions between the two in order to study female empowerment.

II.3 Unit of Analysis and Sampling Method

Amin et al (2003), Evans (1999) and Park (2001) focus on the household level as their main unit of analysis. This is pertinent because this allows measurement of the impacts on microfinance on the grassroots level. Copestake (2001) takes a different approach by surveying individuals (specifically business owners) rather than households, in order to accurately capture the impacts of microfinance on businesses. Again, this is a more robust method than simply looking at the

aggregate statistics because many poor businesses do not join the formal business sector, usually conducting their business via roadside stalls and the like. Finally, Kabeer (2001) is sampling various studies to point out analysis flaws via the meta-analysis in order to explain the various conflicting conclusions on microfinance impacts on women empowerment.

The sampling method for Amin (2003) is a multi-stage cluster probability sample, focusing on villages in Northern Bangladesh. They select 2 villages and then sample the entire female led households and use a probability sample of the male households. Evans (1999) uses a multi-stage cluster sampling approach in their analysis, also conducted in Bangladesh. The first stage was a random sample of 5 rural areas in Bangladesh, with the second stage using clusters of households from the area Rural Development Program offices household data surveys. Copestake (2001) utilizes a stratified random sample of individuals using borrower data from the microfinance institutions in operation in Zambia. The sample is based on three strata, new, established and pipeline (forthcoming) borrowers. Additionally, they utilize focus groups and informant interviews as well as content analysis to provide an insight into microfinance nonparticipation. Park (2001) utilizes a stratified random sampling based on three strata typified by the amount of governmental involvement in the microfinance program. Kabeer (2001) is different once again in that it is a meta-analysis of various studies. The studies were selected by identifying studies conducted to establish the relationship between microfinance and women empowerment in impoverished areas. Each study selected by Kabeer (2001) uses different methodologies in its approach to the research hypothesis, all conducted on the household level.

Overall, the sampling methods used in the analyses follow the random sampling method in order to lend generalizability and external validity to the studies. This is the most appropriate method for a grassroots level analysis especially in that it is a cost effective method of collecting

the individual and household level data. The only exception that one could make on the selected studies is that they usual pertain to a single country. External validity, then, would follow a similar route in that the studies are relevant in being generalized to the populations studied in the select country, but rather less so worldwide. It is this area where this research proposal attempts to diverge.

II.4 Operationalization of Key Indicators

All the selected studies used survey methodology to test for the relationship between microfinance and their variables. Amin et al (2003) defined and operationalized microfinance membership as whether the survey respondent had joined an established and available microfinance program. The study of Evans (1999) used that same measure for microfinance participation as well. Kabeer (2001) uses studies with the same measure in their analysis; however the group studied is limited to women because of the nature of the analysis.

Since Copestake et al (2001) were testing a slightly different relationship (outlined in section II.2); they used the microfinance participation level as opposed to membership. They distributed microfinance participation into three cohorts with "cohort 1" relating to individuals with their first loan borrowed between 1 and 2 years prior to the reference month, "cohort 2" relating to individuals with their first loan borrowed within 1 year and 8 months of the reference month, and finally "cohort 3" with their first loan pending (in process) as of the end of the reference month. Here, cohort 3 serves as the control group in their analysis.

Finally, Park (2001) have used an evaluation research method in their analysis, and thus distribute participation into three categories based on the facilitator of the microfinance program. The three categories are NGO (non-governmental organization) based programs, mixed programs (government-NGO), and government-only microfinance programs.

Amin et al (2003) further measure the poverty and vulnerability of the survey respondents. Poverty is defined by Amin et al (2003) as a household with low consumption levels with respect to the aggregate consumption. This is a very robust measure of poverty since it is not based on the household income level, but directly on the level of consumption. Furthermore, they define vulnerability as a household that is "…unable to smooth consumption in the face of idiosyncratic income fluctuations" (pg. 60 in Amin et al 2003). Income fluctuations are defined as economic shocks such as a drought or floods or even a fluctuation in prices. This implies that the household would be unable to recover from a shock easily, meaning that there is no insurance against unforeseen events. So vulnerability is operationalized using household income and consumptions levels and a risk-sharing test, whereby household consumption varies with aggregate consumption, but not with household income. Simply stated, the ability of a household to maintain its *real* consumption level regardless of fluctuations in household income implies less vulnerability.

Evans et al (1999) use a similar approach to measure the wealth group of survey respondents as Amin et al (2003), but with a few key differences. Evans separate the respondents into three wealth groups, group 1 are food secure (not vulnerable) and have relatively high income and assets, and land / business ownership. Group 2 are the moderately poor group with periodic food insecurity (marginally vulnerable) and are labor intensive, with low income levels and little to no assets or land / business ownership. Finally, group 3 is comprised of households with chronic food insecurity (very vulnerable), are labor dependent as their main source of survival, and finally, possess little to no assets or land / business ownership. This approach is similar to Amin et al (2003) because they (Evans et al) do not rely on income levels alone to stratify their sample

into the three groups. Again, this method of including consumption lends robustness to their measures.

As an alternative, Copestake (2001) use individual wellbeing as one of their key variables. They utilize income growth as the indicator for the wellbeing along with survey responses and focus group analyses. While consumption level is indeed important for the households, the overall income level has a direct impact on the consumption in the short term. This shows a viable alternative to the use of household consumption data as an indicator of poverty. Copestake (2001) also used the impacts of microfinance on business performance as another indicator of general wellbeing. Here, business performance was defined and operationalized as the change in business profits before and after receiving the loan. Since business profits are another source of income for the loan recipients, and all the respondents were business owners by design, growth in business profits would translate to household income growth. The key difference is that wellbeing is measured both via the growth in income as well as a qualitative analysis on the quality of life via interviews and focus groups.

Park (2001) carried out an evaluation of microfinance programs in China. Their analysis was different in that while indeed households were surveyed, they used the survey results to capture the effectiveness of the microfinance program in China. The effectiveness of the program was operationalized using 3 key measures, *Targeting*, *Sustainability* and *Impact*. The targeting measure is defined as that ability of the microfinance program to target the poor. This was measured via program eligibility rules and qualitative responses on the survey. Sustainability of the microfinance program is defined as the financial and operational performance of the program, and is measured by loan repayment frequencies and repayment incentives. Since a high level of repayment activity suggests profits for the lending institution, a high repayment rate

would necessarily suggest a sustainable microfinance program. Finally, Park (2001) utilizes a measure for the impact of the program, where impact is defined as the ability of the program to alleviate poverty. Here, Park (2001) uses a change in household income to measure the impacts of microfinance, similar to Copestake (2001).

Finally, in reference to a measure of female empowerment utilized by various studies analyzed by Kabeer (2001), the measure varies from study to study, though this is where Kabeer (2001) finds the disparity in the analyses. The measure is defined as the extent to which microfinance allows women to be independent in the paternalistic societies. Examples of operationalization of the measure include an index of "managerial control" over the loans by women, and surveys conducted to analyze the rate of domestic abuse and child schooling patterns.

II.5 Section Summary

From the surveyed literature, the importance of adding a time dimension to the research proposal cannot be understated. As is the case with any contemporary economic development study, a cross-sectional analysis proves difficult in establishing causality. Similarly, the use of a true experimental design is also unfeasible because of the nature of microfinance. Since microfinance is another tool used to alleviate poverty, systematic exclusion of any group from accessing microfinance is unethical. Although the Cohort Design is the most popular design in the literature, the proposed research does not stratify the population by gender or income level (though they may well be factors that affect the outcome). The research proposed here is more general in nature asking for a simple causal analysis regardless of demographics. What this implies is that we are trying to gain as much external validity as possible in order to analyze the effects of microfinance, both on a grassroots and national level. Therefore, the best design for

this specific research proposal would tend be a quasi-experimental time series design as used by Amin et al (2003).

For the sampling methods utilized in the surveyed research, most authors have opted for a stratified random sampling method, which indeed assures representativeness with respect to each strata (or cohort) in the analysis. The issue here is that this method requires information from the population being studied. As far as this proposal is concerned, the only strata we would need to divide the surveyed groups by is on income level, or specifically where the respondents are in relation to the poverty line. Therefore, the best method for our analysis is similar to the multi-stage random sample used by Amin et al (2003).

Finally, as far as the operationalization of the relevant variables are concerned, there are two main methods utilized to calculate poverty. The method used by Amin et al (2003) is to calculate the level of household consumption, which is complicated and requires a greater amount of information requested on a survey. The other method is much simpler and used by Copestake et al (2001), Evans et al (1999) and Park (2001). This method simply uses the income level of the survey respondents in relation to each country's own poverty line, in order to calculate the level of poverty experienced by the respondent.

III. Methodological Plan

III.1 Research Hypotheses

For each hypothesis stated in section I, a detailed description is as follows:

For hypothesis (1), as the overall amount and number of loans to the poor increase, there should exist a direct positive relationship with the recipient's income over time. Presumably, the intent behind this form of lending is to provide the very poor with the same opportunities afforded to the other economic classes. Thus, if utilized effectively, microfinance is a tool that the poor can use to pull themselves out of poverty. Hypothesis (1) then, tests to see if that is what is truly taking place in the developing economies. The operational definition of Poverty is outlined in section III.6 below.

Hypothesis (2) is aimed at the theoretical concept of income inequality and its relationship with poverty. The concept behind income inequality is that it relates to the distribution of income within a particular economy. This hypothesis is relevant to the study since the actual measure of poverty may not translate into an increase in the quality of life. We can define the level of poverty for a particular region as the value of a basket of goods needed for survival; however, simply increasing the income level of an individual may not be the same as increasing the quality of life. To be truly sustainable, the income inequality (based on the result of the hypothesized decrease in poverty) can be expected to decrease as well.

Finally, the third hypothesis (3) included in the proposal is another test to see if microfinance is indeed achieving its goals. Since the small loans provided are designed to increase entrepreneurship within the poor, we would expect to see an increase in the overall number of small businesses and entrepreneurship activity in the regions studied.

III.2 Unit of Analysis

Perhaps the more obvious solution to study this issue (the least-cost method) would be to study the impacts of microfinance at the country level, with an analysis based on the aggregate figures of all developing economies. The overall figures of developing economies, however, are well known to have measurement problems, especially when the macro-level variables are recorded in a manner tailored to (and indeed measured by) the developed economies. As an example, much of the production in developing economies takes place in the informal sector (for example, basket weaving in Africa or stall-holders in India). By contrast, a vast majority of the production in developed economies takes place in the formal sector. Therefore, with developed economy calculation methods, the overall gross domestic product for developing economies is understated. While country-level data can help us identify the causal direction between microfinance and poverty, the measures would not be nearly precise enough for this analysis. With this characteristic in mind, the main method of variable measurement is on the country level but it must be supplemented with household level evidence so that we can achieve a greater level of accuracy and robustness in describing the nature of the relationship between microfinance, income inequality, poverty and entrepreneurial activities.

Therefore, for the second research method (outlined in section III.3 below); we would need to change the unit of analysis from the country level to the individual household level. The surveyed literature on microfinance uses the household unit of analysis because the principal investigator has greater control in the measurement of the key explanatory variables. The first research design can remain unchanged, but there will be differences between the additional independent variables for the second design since not all the household characteristics can be described in aggregate terms. Since the sampling method utilized on the household level can

allow for generalizability, we can use this data to cross-check against the aggregate variables for the region in question; in order to make sure that the causal direction satisfied. Data would then be collected from the selected households via an annual survey. Since sustainability is an important component of the effects of microfinance, the survey would need to be conducted for at least a five year period (see appendix I for a sample of survey questions).

In sum, data collected on the household level (as described in section III.5 and III.6 below) can be tested against data collected on the country level in order to ensure the external validity of the research design.

III.3 Research Designs

The research hypotheses proposed in this paper cannot (by their very nature) lend themselves to be of a pure Experimental Design. As stated earlier, if microfinance is available in the varied economies and regions, it would be quite unethical to propose a population to be systematically excluded from the opportunity. However, the study lends itself to a Quasi-Experimental Time Series Design similar to the one employed by Amin et al (2003). Observations are made on the sampled households at the beginning of the analysis and then every subsequent year over a 10-year period. Using the observational data, we can calculate the regional income and microfinance participation levels. The changes in income every year would provide an answer to the nature of the relationship. Furthermore, we propose to stratify our sample, based on the microfinance participation data, in order to set up a natural experiment (the Non-equivalent Control Group Design) with the "control" group containing non-participants and the "treatment" group consisting of microfinance participants. Observing these two groups over time can add further validity to the design as long as maturation and attrition among the groups is at a manageable level. This would imply that if we can define a particular attrition rate, we could start the

research with a sample size that would allow for such variations. For example, if the attrition rate on average is thought to be around 10% per year, in order to ensure a final sample of 3,500 respondents we would need to start the initial survey sample size at the minimum level of 10,000.

On the aggregate level, since we are interested in the direction of the relationship between the dependent and independent variables, and we know when the independent variable was introduced into the model (i.e. when the formal method of microfinance was introduced into the economy), coupled with the fact that the aggregate level variables have been measured before the advent of formal microfinance institutions, a simple retrospective directional analysis can be readily available. Furthermore, in order to cross-check the results of the household level design, we can additionally set up a prospective research design by using country level statistics provided by the World Bank pertaining to the years where the survey was conducted at the household level.

III.4 Sampling Method

For the country level unit of analysis, no sampling is necessary for the retrospective design, since there would be no reason to exclude any country from the analysis, especially since the countries are studied individually. This assumes, as a matter of course, that the level of microfinancial activity for all countries and for past years is available. However, if microfinance lending data cannot be obtained from all countries, a systematic sampling technique can be utilized to obtain data from the poorest countries. For the prospective country level research design, the only data we would require is the one from the regions selected at the household level, and thus the sampling technique below would dictate the countries selected for this proposal.

For the household unit of analysis, a multi-stage random sampling technique would be utilized. The population for this analysis would be all households in developing economies, with the first stage being the random selection of countries, the next stage a random selection of *rural* districts (emphasis added) and finally, a random selection of households with equal probability within the certain district (regardless of income level). This would allow us to generalize the results to the aggregate level and form a basis of comparison to the country level indicators. The reason for selecting just rural households is that as a greater number of developing economies are being industrialized, the probability of randomly selecting a poor household from an urban area drops dramatically. Since we plan to sample households regardless of income level, we would need to reach out to areas where the probability of sampling a poor household is higher. Since we are sampling from the rural areas alone, there is a concern regarding the generalizability of the data, especially in comparison with the country level variables. However, since microfinance is theoretically concentrated in areas with high levels of poverty, this may not be an issue.

III.5 Main Independent Variable

The main independent variable for all three hypotheses outlined above is the amount of microfinance lending. This is operationalized for the country level design by calculating the total amount of loans made by the major microfinance houses operating within each sampled country for each fiscal year. The data is proposed to be collected from the tax filings of the lending institutions in operation within each country for every year included in the study. Since the amount of loans made would vary over time, the directional impacts of the loans on each of the dependent variables can be studied. There are nations where the tax filings of the microfinance institutions are not made public. This is especially true in areas where the microfinance

institution is very small and/or privately owned. In order to get the data for these areas we would take the data from the household survey as described below.

On the household level, a more relevant figure would be achieved by asking the respondents on the survey to state the amount borrowed from the microfinance lending institution in the prior year. It is important to state that the data collected on the level of microfinance is indeed for the prior year because the impact of the loan on income level would not be expected to be instantaneous. Therefore, on both the aggregate and household levels of analysis, the time lag between the receipt of a loan and the impact on income is taken into account by utilizing the prior years' level of microfinance along with the current years' measure of the dependent variables. This would also provide a viable alternative in the event that the country level data from the microfinance institutions is not readily available.

III.6 Dependent Variables

Based on the hypotheses proposed above, three main dependent variables will be tested against the main independent variable (i.e. amount of microfinance lending). Measures for obtaining data for the dependent variables are given in the following order: poverty, income inequality and finally, entrepreneurship activity.

Amin et al (2003) defines the "poor" as a household that has low consumption levels. Using this definition, we can operationalize the poverty measurement by assuming that the "poor" in question have low consumption levels due to a low level of income. Thus, for the country level unit of analysis, the main method employed to measure poverty is by using secondary data published by census agencies within the countries analyzed. Controlling for inflation, the overall number of households living earning less than 1 USD and 2 USD is captured by the World Bank. The World Bank defines the concept of "Absolute Poverty" as the people living under 1 USD per

day. Keeping this concept in mind, we propose to test for both reductions in absolute poverty as well as poverty defined in relation to the countries' own poverty line (a nations' poverty line is calculated as the lowest amount at which one can afford the goods needed to survive). Thus, we can expect a reduction in the number of poor households with increasing levels of microfinancial activity.

Furthermore, the level of poverty (for the household unit of analysis) can be measured by first defining a "poverty line" for the country, and then the difference between the household income level and the poverty line would represent the level of poverty faced by the household. Since we have a more accurate picture of individual household income levels, we can further establish the poverty line based on either the published national figures for the country in question, or on the average *perceived* household price of a basket of goods that are necessary for subsistence within the region (see sample survey questions in appendix I). Therefore, the more the household income is below the poverty line, the greater the level of poverty for the household. The actual data on household income levels would be a component of the survey conducted and then included in the calculation outlined above.

Secondly, in regard to income inequality, the aggregate level data can be obtained by the government statistics department of each country in the sampling frame. Income inequality is usually defined by the statistical "Lorenz Curve" where the percentage of income held by each quintile of the population is reported. Thus, the income share held by the lowest 20% of income recipients in the population is used to determine the impacts of microfinance on income inequality. As the amount of microfinancing increases, so would the income share of the lowest 20%. It is important to motivate the difference between an increase in income (decrease in poverty) and a reduction in income inequality, however. A potential increase in income for a

poverty stricken household can come from any income quintile in the population, but income inequality can only truly be reduced in the income stream for the lower quintile is coming from one of the upper quintiles in an economy. In other words, this can also be thought of as a measure of how the entrepreneurship activity in impacting the general economy.

On the household level, since we are gathering data on a random sample of the population, the intrinsic value of income inequality can be measured by utilizing the same methodology used by the national reporting agency. We would propose to use the income level reported for each respondent household to calculate the sample percentile each household belongs to as well as the average income for each of the sample quintiles. Thus, for each nation we can calculate the inequality level for all households selected in our sample. While the measure for poverty is a more absolute number and may be generalized for the population, it is important to mention that our sample contains rural households and thus the measure for income inequality will not accurately translate to the aggregate figures. However, we can still compare the directional outcomes for both measures in order to solidify the result of the hypothesis.

Finally, the last dependent variable is the level of entrepreneurship within each of the regions used in our sample. On the aggregate level, this variable would be very difficult to measure since a lot of the entrepreneurship activity within the poor is not recorded as a part of the "formal sector" (the formal sector may be defined as the portion of the economy that is legitimate and recognized by the state). Thus, an individual accessing microfinance loans could not be expected (on average) to register his business with any government agency (such as an association for small enterprises for example). However, a rough estimate for this figure may be calculated by the number of loans made by the operating microfinance institutions. The underlying theory is that since microfinance lending primarily operates to induce entrepreneur activity in the poor, the

higher the number of loans made would mean a higher aggregate level of informal sector business activity. This measure (number of loans) would be different from the level of microfinance defined earlier. The data for this measure is to be obtained from the tax filings of the microfinance lending institutions. In lieu of tax filing information, we would seek to obtain these data from the household survey.

On the household level of analysis, the survey would ask the respondents to state the number of loans received in the current year. This data variable collection is possible since the loans (by their very definition) are short term in nature, thus any household is free to take multiple loans in a given year. Assuming each loan facilitates the entrepreneur in conducting his/her business, the survey would actually provide us with a far more accurate measure of the level of entrepreneurial activity in each household (as compared to the aggregate measure).

IV. Ethics Statement

Please see attached certificate.

V. Statement of Limitations

There are still a number of problems with the design as far as internal and external validity are concerned. We have suggested a multiple design approach to combat some of the issues that may arise from a more simplistic methodology. The absence of randomized control groups continues to be a problem, though that is handled by using non-participants as an additional control in the design. Furthermore, history presents a problem in that we plan to sample the households at a specific point in time but circumstances occurring prior to the research may impact the results. We suggest a retrospective country level analysis to control for such factors, however it is

unclear whether the data collected over the past will be able to explain some of the variation in the final design, especially at the household level of analysis. Instrumentation can also be a factor and thus the researchers would need to carefully plan out the survey and avoid making any changes after the first one is administered in order to ensure data consistency.

Maturation and attrition would continue to pose problems for this design however. Plus, since the data is analyzed over time, it would be very difficult to replace the respondents accurately. This is why we would need to use a large sample in the beginning so as to ensure that both problems can be accurately handled. Furthermore, a large ample size up-front would also allow us to handle the potential disadvantages of using a multistage random sampling technique.

Appendix I – Sample Survey Questions

1. What is the average daily income for your household?
2. How many micro-loans has your household received this year?
3. What was the total amount of money borrowed by your household in the past year?
4. In your area, how much would it cost to feed your household for a single day?

VI. References

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