1. TITLE PAGE

Understanding and Improving Financial Access for the Poor

Proposal to BASIS CRSP via the University of Wisconsin

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2. ABSTRACT

We propose several field experiments in Ghana to evaluate and improve access to credit, insurance, and savings. We build on prior work that combines randomized-control protocols with data collection to answer fundamental economic and policy questions. We also leverage a panel survey being conducted on 12,000 households. To arrive at policy prescriptions, we address three sets of questions: 1) what demand and supply mechanisms, and market failures, create obstacles to financial access? 2) what innovations are viable for expanding the quantity and quality of access? 3) what are the impacts and welfare effects of interventions that expand access?

We have two common methodological themes to address external validity issues: 1) We will develop replicable field experimental methodologies and work to train researchers and disseminate practitioner and researcher tools that help explain these methodologies for others. 2) We will combine structural and experimental analysis in order to push forward answering policy questions with structural models, but with identification generated from experimental methods. By incorporating such attention to theory in the analysis of data, we are able to simulate important distributional, selection and short-run versus long-run effects but with confidence in identification of key instruments, such as access to particular financial products.

3. NARRATIVE DESCRIPTION

We propose a series of field experiments in Ghana on credit, insurance, and savings. Our methods build on prior work that combines randomized-control protocols with supplementary data collection to answer fundamental economic and policy questions. Our substantive goal is to identify microfoundations of the demand and supply of financial services for the poor such that better innovations can be designed to help individuals accumulate assets and cope with risks. To arrive at such policy prescriptions, our projects will address three sets of questions.

First, what demand and supply mechanisms create incomplete access? Understanding how and why markets fail to provide access for the poor is critical to designing and replicating innovations that improve access. For credit and insurance markets, we design and implement experiments to identify how interest rates, premiums, and other contract terms affect financial access. We examine how interest rates affect the outreach and usage of financial services (price rationing), as well as the specific presence and magnitude of adverse selection and moral hazard in both credit and insurance markets. For savings markets, we focus on identifying the empirical relevance of commonly cited psychological and social barriers to savings, and on studying the impact of different interventions on client welfare.

Second, which innovations are effective at expanding access? Innovations may take many forms, and we focus on product development, product presentation (marketing), contracting, and risk assessment. Our work in microcredit and insurance markets focuses on contracting schemes (e.g., group vs. individual incentives in credit, compulsory vs. voluntary insurance add-ons to microcredit, timing and enforcement techniques, etc.). Our work on microsavings focuses on developing and marketing products that are designed to help households overcome presumed psychological and social barriers to wealth accumulation.

Third, we examine the welfare implications from interventions that expand access to financial services. Our credit innovations will expand access often by randomizing an "encouragement" design over geographic areas (e.g., markets or villages) in order to assess impact of credit. Our microinsurance innovations will test the impacts of schemes to expand access by using MFIs as insurance wholesalers.

Hence assessing the welfare implications depends on measuring the impacts of insurance access on health status, risky investments, informal insurance markets, claims experiences, microfinance client acquisition and retention, and loan repayment rates. Our savings innovations will expand access by developing and marketing new products and product features. Hence assessing the welfare implications depends on measuring the impacts on household savings rates, shock protection, and intra-household bargaining, and on MFI client bases and profits.

External validity of empirical research should always be a concern. Whether experimental or not we need to know which findings are systematic and which are not, and then ideally in the long run begin to learn *why* some results hold in some places and others not. With evidence on how complexities such as culture, legal institutional strength, technological sophistication, regulation, and social networks influence the answers to our questions, we can begin to write better policy prescriptions. Developing methodologies that are replicable in multiple countries, and disseminating results and writing methodological papers to explain the process involved, are critical steps to working towards such replication. Such dissemination efforts are important to the success of this agenda and proposal in particular, and are included in the work plan. This is necessary to address the critical policy and evaluation questions of whether (and how much) the microfoundations, innovations, and impacts of expanded access to financial services differ across settings.

Yale University Economic Growth Center Dataset

Several of the field experiments proposed here will take advantage of a unique panel dataset designed to provide a new data base for carrying out a wide range of studies of the medium- and long-term changes, or lack of changes, that take place during the process of development. A new comprehensive household survey of 5,000 households will be undertaken in 341 enumeration areas (EAs) in Ghana in collaboration with the Institute of Statistical, Social and Economic Research at the University of Ghana (ISSER), and with the Ghana Statistical Service (GSS). The households are of the 7,000 households surveyed in the Ghana Living Standards Survey 5 (GLSS5), plus 5,000 households in the

MiDA (the Ghanaian government unit responsible for administering the US Government MCC compact funds) area, that are part of the MiDA evaluation. Our co-investigator, Ernest Aryeetey, has a contract with MCC to conduct the evaluation of the MiDA interventions. Thus, the resulting data set will be representative of the nation, but over-weighted in the MiDA regions.

Funding for survey is provided by the Economic Growth Center (EGC) at Yale, and by MCC for the MiDA households. The survey is being designed collaboratively between the EGC, ISSER and the GSS. The GSS will carry out the survey, with ISSER providing outside monitoring and supervision.

The plan is to re-interview all of the adult respondents in the first, baseline survey every three years regardless of where each individual or household might have moved over the interval. By committing to a very long term, comprehensive study that obtains information on individuals through their life courses the data set will provide a foundation for the investigation of the large set of issues that have remained outside the scope of scientific analysis.

Where appropriate, we will be able to insert questions relevant to specific interventions into the dataset, utilizing the survey as a basis for conducting baseline or follow-up surveys to measure impact, as well as impact over the long term. In some cases to obtain adequate power we will need to augment the number of households surveyed in a given enumeration area.

I. <u>Research Question #1: Demand & Supply Mechanisms of Microfinance Access</u>

A. Interest Rate Projects: Opportunity International

Background

Policymakers (e.g., CGAP) often presume that the poor are largely insensitive to interest rates, and then prescribe that MFIs should increase loan rates without fear of reducing access. But this presumption is based on scant empirical evidence (Morduch 2000; Armendariz de Aghion and Morduch 2005). Meanwhile many industry observers and program managers have expressed concern about whether existing outreach methods effectively reach poorer segments of MFI target populations. Pricing may be critical component of outreach strategies, and more evidence is needed on the average and relative price sensitivities of MFI target populations. Lowering interest rates may be one way to increase demand while also widening the pool of microentrepreneurs who are able to borrow profitably at those rates.

Two recent studies in developing country settings, for instance, cast some doubt on the argument that MFI clients will borrow at relatively high rates. Karlan and Zinman (2006) uses a large-scale randomized-controlled trial to trace out demand curves for consumer credit in South Africa. Demand for credit increased only gradually with reductions in interest rates below standard rates, but the cost of increasing outreach with lower rates (in terms of foregone profits) was small. In contrast demand declined sharply at rates above the lender's standard rates, and hence higher rates were counterproductive on both sides of the "double bottom line" (profits and outreach). This study was performed with a consumer credit lender in South Africa, and we now need to examine whether these findings apply to more "traditional" MFIs that target microentrepreneurs. Further evidence on sensitivity to interest rates comes from Dehejia, Montgomery, and Morduch (2005). They find that microcredit clients in Dhaka, Bangladesh reduced borrowing sharply following interest rate increases. Thus both studies find large demand elasticities to interest rate hikes, *on average*.

The two studies find potentially important differences with respect to *heterogeneity* in price sensitivities across targeted groups. Dehejia et al find that poorer clients are three times more sensitive to changes in interest rates. Karlan and Zinman also find some evidence that price elasticities decrease with income, but the size of the difference is smaller (1.5 times more sensitivity for relatively poor clients). These studies suggest that MFIs and policymakers need to seriously consider the impact of pricing strategies. High interest rates may push poorer segments out of MFI programs, while lower rates may be an effective means of expanding targeted outreach.

We propose a series of studies in Ghana with Opportunity International's microfinance organization. Our primary goal is to measure the impact of price on outreach: as MFIs change interest rates, how does this change the volume and socio-economic composition of their borrowers? The answer to this question lies in identifying how and why price elasticities vary across different market segments. Are the poorest of the poor screened-out by the higher interest rates? Further, also important, questions will help understand the decision-making process and shed insight into proper regulatory policy on disclosure: will financial literacy training increase or decrease the elasticity with respect to interest rates? And will such training differentially effect the more (or less) educated or poor? (See later in this proposal a discussion of financial literacy and how it relates to this project.)

Project Descriptions

We are partnering with Opportunity Ghana to conduct direct marketing of an individual loan product to microenterprise owners in the Greater Accra metropolitan region. Rates are assigned within a predetermined range by the lender based on their market research. We then track take-up rates, loan amounts, repayment rates, and client retention achieved from the various offers. We also collect baseline data in order to examine some drivers of price elasticities. One key margin is competition; e.g., the number, offerings, and market shares of lenders in our partner MFI's vicinity. Another key margin is of course the socio-economic characteristics of potential borrowers. Account officers or survey teams will collect observational and self-reported measures of the (potential) borrower's household and business. Operating in a range of physical environments (ranging from rural to urban, remote to central, agricultural- to service-dominated) will enable us to shed some light on how product markets and location affect price sensitivities.

The question remains whether the clients brought in by lowered interest rates are new to credit or if the clients have simply shifted from one lender to another. We suggest that each potential client falls into one of the following three categories:

1. The potential client is new to credit.

2. The potential client has a loan at another institution and takes on a second loan through the credit offer we are studying.

3. The potential client has a loan at another institution and switches lenders to take advantage of the credit offer we are studying (presumably because it offers lower interest rates).

To identify into which of the above three categories the potential client falls we will conduct a follow-up survey on all those offered credit. The results will enable us to distinguish an expansion of financial access from crowd-out of other borrowing. Although not part of this proposal, we are also working on interest rate experiments in Mexico, Peru and the Philippines. Part of the dissemination we intend to do from the Ghana study will incorporate lessons learned from other sites, in order to begin to understand which realities of the market structure hold across these different settings, and which do not.

B. Returns to Capital

Background

Perhaps those who do not borrow at high rates do not do so for a simple reason: their opportunities are not sufficiently profitable. Identifying returns to capital is critical to understanding how microfinance markets interact with other markets—principally those for products and labor—to affect the welfare of our target populations. But unsurprisingly, clean evidence on returns to capital, and heterogeneity therein, is scarce.

We propose estimating the rates of return to capital for micro-entrepreneurs in Ghana using a field experiment that randomly assigns cash or equipment grants to micro-entrepreneurs.[1] As with the other components of our proposal our primary methodological goal is to develop a replicable research design, based on best scientific practices, which can be implemented elsewhere in the world. This again will permit the accumulation of systematic and reliable evidence on the same question in different settings.

We need to examine whether selection into (or out of) credit programs is determined by the returns available (or not) to that micro-entrepreneur. By tying this experiment back into the interest rate experiment, we can begin to unravel this mystery more precisely. Are the enterprises with returns to capital higher than current interest rates less sensitive to interest rate reductions (presumably because their

[1] Our methodology is similar to de Mel, McKenzie and Woodruff (2006), except we intend to focus more on heterogeneous treatment effects and spillovers to labor supply, rather than the average level of returns to capital as they do.

reasons for not borrowing are not price-based)? Conversely, are those enterprises with returns to capital below the current interest rates more sensitive (because for some, the lower interest rate then makes borrowing a profitable proposition)? In order to make this link cleanly to the interest rate experiment, we will conduct this experiment in Ghana alongside the interest rate experiment.

Two sub-questions motivate our research design: (1) What is the heterogeneity in returns to capital across microentrepreneurs with different characteristics (e.g., by education, age, family structure, experience, wealth, etc.), and (2) What are the thresholds within an enterprise at which we observe changes in returns to capital (e.g., why are family enterprises often reluctant to employ outsiders, and instead expand their household enterprise up to the point of full employment of the household members but not further)? These are both critical questions from a policy perspective for microfinance organizations around the world. They inform policymakers about the opportunities that exist but are unfunded, about the potential impact from completing missing capital markets, and about what interest rate policies could be welfare enhancing.

C. Health Insurance Markets

Background

Poor households are often vulnerable not simply because they lack a sufficient *level* of resources, but also because their resources *vary* from shocks to income or expenditures. Studying the interaction between credit and insurance options is critical for understanding how the poor make investment and consumption decisions. Armed with this information, academics can then help programs and policymakers design interventions that help poor households smooth shocks. When insurance markets are missing or incomplete, credit contracts (if available) can serve as a form of insurance (Udry 1994). Such contracts are not first-best, however, and further work to understand why insurance markets are incomplete in the first place should help us understand how best to design products and institutions that can offer individuals the insurance they need, at prices they can afford.

We will address two main questions on insurance market mechanisms. The first is the extent of adverse selection. Adverse selection is the primary motivation for government intervention in health insurance markets (including incentives for workplace provision and other pooling mechanisms), yet there is little convincing evidence on its prevalence or magnitude, particularly in developing countries (Cutler and Zeckhauser 1999).

The second set of questions asks whether insurance access changes borrowing behavior. Most microcredit lending contracts require the borrower to commit to fixed payments at fixed intervals. Many poor microentrepreneurs report behavior that is consistent with self risk-rationing: they do not borrow because they are afraid of not being able to repay their loans if they experience a shock (Boucher, Carter and Guirkinger 2005; Boucher and Guirkinger 2006; Boucher, Guirkinger and Trivelli 2006). The health insurance interventions we are testing plausibly mitigate this form of credit rationing by helping smooth some of the larger and more prevalent shocks faced by microcredit clients. The testable implication is that increasing insurance access should increase loan demand; the hypothesized effect on loan repayment rates can go either way and is equally critical to identify for research, policy, and programmatic purposes.

Project Descriptions

Here we intend to replicate work done in the Philippines, except now, taking advantage of the panel dataset from the Yale University Economic Growth Center, we have much richer information and a larger sample size. The panel data includes information on the risk characteristics, informal insurance arrangements, risk management, and health of individuals throughout Ghana. We then work with a microfinance organization (likely Opportunity Ghana or an affiliate of theirs, through their parent organization Opportunity International). We will work with our partner organizations to test their health insurance products, and employ an experimental design as follows: (1) High premium group, in which clients (typically randomized at the village level) pay a higher premium (which is then lowered after enrollment), (2) Low premium group, and (3) Control Group, in which villages will not be offered the health insurance during the evaluation period. By collecting baseline risk characteristics and randomizing assignment to high and low premium groups, we will be able to test for adverse (and advantageous) selection into the health insurance program, using data on claims and procedures as the outcomes of interest.[2] By including the control group, we can measure the impact of health insurance on a litany of important wellbeing outcomes, from economic to health to social. Follow-up data on informal insurance arrangements will enable us to test for crowd-out of community-based risk-sharing mechanisms. And of course we will use the Bank's data on client retention and repayment, together with the claims data, to examine whether and how access to health insurance improves the performance of microcredit, if there is overlap between our sample frame and that of the Bank's clients.[3]

II. <u>Research Question #2: What Innovations Effectively Expand Financial Access?</u>

Savings Behavior

Many MFIs offer savings products as part of their outreach and sustainability strategies. Savings are of course an important tool for the poor for smoothing consumption, mitigating shocks, and financing investments in human capital and businesses. Savings can also serve as collateral for a loan. Yet fixed costs and psycho-social barriers can make designing viable formal savings mechanisms difficult.

We are expanding prior work on the design, pricing, and presentation of savings products with new experiments in three countries. Prior work with Green Bank in the Philippines found that offering clients a savings commitment device significantly increased savings rates (Ashraf, Karlan and Yin 2006b) and female empowerment (Ashraf, Karlan and Yin 2006a). New randomized controlled trials in Peru, Ghana and the Philippines, will further examine whether and how commitment features can facilitate savings among the poor by systematically testing the efficacy of different product designs in helping individuals reach their savings goals within formal savings institutions.

[2] Our impact study (see Research Question #3) also provides a one-sided test for the presence of moral hazard: moral hazard exists if those offered insurance experience worse health outcomes than those not offered insurance, due to increased risk-taking.

[3] Note that we will also analyze the impact of access to health insurance on health and other outcomes as discussed in more detail in the Health Insurance section of our third Primary Research Question below.

All savings products offered in these studies will have a commitment feature of various strength (some contractual, some merely psychological). The client sets her own savings goal item, goal amount, and goal date. In contractual commitment treatments the client will not be able to withdraw the savings until she reaches the goal. We also evaluate the following additional features: (1) Pricing, by randomly varying yields and/or bonuses; (2) Deposit reminders, by randomly assigning reminders of different frequency and time paths; (3) Framing, by randomizing the content of the reminders to emphasize either positive aspects or the negative consequences of not reaching the savings goal; (4) Mental accounting, by providing randomly selected clients with a puzzle that forms a picture of their savings goal and is filled in, piecewise, with each deposit.[4]

Testing impacts of these features of product design, pricing, and presentation on savings rates and client bases will provide both academic and practical insights. Academically, the effectiveness (or lack thereof) will shed insight into the drivers of household decision making (as discussed in our section on Research Question #1). Practically, our projects will provide pilot tests and "proof-of-concept" (or lack thereof) for specific savings innovations that can be replicated by MFIs worldwide.

Although at one level a program evaluation, the true goal here is to learn more about the specific psychological mechanisms that lead individuals to save, or not save, on a regular basis. The above interventions are all designed to unravel this mystery, and thus form a crisper understanding of this inherently complicated decision. This is critical for forming policies that help the poor build assets for both investment and reduction of vulnerability. Lastly, we of course cannot conduct this research void of thinking about supply considerations. Why, if these ideas work, have financial institutions not already offered them? Is it a simple case of an innovation that needs to be tested and proven before for-profit entities are willing to risk their capital? Can these exercises prove the concept, both the benefits and the costs, and thus motivate other financial institutions to create such accounts? Part of the mission of our

[4] Our gain/loss frame and mental accounting treatments are designed to counteract a particular psychological mechanism that has been hypothesized to depress savings: loss-averse individuals (in a prospect theoretic sense) feel the savings contribution as a "loss". Our treatments thus seek to shift focus from the contribution to the more neutral or gain-oriented overall savings goal, and thereby reduce any utility loss associated with savings flows.

organization and the activities in this grant proposal in particular is to take research to this next step, to make sure the results of these projects are disseminated properly to the "real world", both policymakers and businesspeople, so that successful ideas are successfully replicated and scaled.

III. <u>Research Question #3: Welfare Effects of Expanding Financial Access</u>

A. Health Insurance

Low-income households in developing countries typically face limited access to formal sector insurance despite the potential benefits described in our section on Research Question #1. As noted above, one increasingly common vehicle for expanding access is enlisting MFIs and other large organizations (e.g., employers) as insurance wholesalers. But there have been no rigorous evaluations of the efficiency of such schemes.

Our experimental design includes a control group that does not get offered insurance during the study period. Consequently we can compare the control group to the treatment groups (which are offered health insurance as an add-on to microcredit on either a voluntary or compulsory basis) to estimate the impact of access to health insurance on individual risky behaviors, investments, and health outcomes. Many microfinance institutions around the world have begun to offer health insurance to their clients; however, there has been no rigorous evaluation of such services that inform us of their impact to either the client (health and labor supply, e.g.) or the microfinance institution (client retention, loan size, and loan repayment, e.g.).

B. Credit Linked with Crop Price Insurance

Our partner for this experiment is Mumuadu Rural Bank located in Osino in the Eastern region of Ghana. Although the majority of the population in Mumuadu's catchment area are farmers, agricultural loans comprise less than 3% of their overall loan portfolio. Mumuadu recognizes that lending to farmers is an important, currently overlooked, business opportunity. Focus group meetings with farmers in the indicate that many farmers want to borrow under the right conditions but are unclear about the role of banks in general and fearful of default. Many farmers thus do not obtain financing for potentially profitable investments. This argument has been made by Boucher, Carter and Guirkinger (2005; 2006; 2006), and this study intends to test these ideas directly.

Working with Mumuadu, IPA has developed an insurance product (currently being marketed in a pilot) which will forgive 50% of the principal and interest of farmers' loans if the average price of their crops at harvest falls below a given level. By working with the Ghana Ministry of Agriculture, extension agents, farmers, and Mumuadu Rural Bank IPA has obtained a picture of historical crop price volatility, and its potential impact on farmers' ability to repay their loans. In particular, three crops have initially been proposed for study, due to their prevalence in the region and their particular volatility: eggplant, maize, and tomatoes. Based on historical crop prices and discussions to understand farmer's cash flows, IPA and Mumuadu have calculated trigger prices for each crop, below which farmers could not be expected to both feed their families and repay any outstanding debt. The loan product with the insurance component will be marketed to farmers with a simple explanation of this.

The goal of the product is to reduce farmers' risk in investing in agricultural inputs, and thus encourage them to make productivity-enhancing investments. Farmers will know that if they take a loan to purchase fertilizer and other inputs they will either make the money back from improved crop yields, or if the crop price is low, much of the loan is forgiven.

Priced fairly, the product undoubtedly makes financial sense for many farmers; by investing more in their crops they are more likely to earn increased farm income. Of course, traditional insurance is not an easy sell for those unfamiliar with the concept. A typical misunderstanding occurs after the initial period of coverage when those who have not filed a claim return to request a "refund." We will use a randomized controlled trial to test out the new loan product and differential access to financial training to figure out which combination of product and training is most effective (see Section C below). Additionally, we will conduct household surveys and measure farm output to determine the impact of the intervention on crop yields and farm profits, and household consumption.

C. Financial Literacy Training

A related goal of the crop-price insurance study is to determine how financial literacy education impacts the initial decision of a farmer to take a loan or not. As such, IPA will hire a financial education expert who will work with Mumuadu to design financial education modules which can be implemented as a stand-alone intervention for entrepreneurs and farmers, or in combination with specialized financial products – in this case, the crop-price insurance product. The content of the modules will be determined by the financial education expert in conjunction with Mumuadu, and may include basic accounting skills, cost-benefit analyses, savings and investment decisionmaking, evaluating financial products, or other relevant skills. Mumuadu employees will conduct these financial trainings for a selection of farmers *before* marketing them the loan offers, to see the impact of the trainings not only on loan usage and repayment, but also on the initial loan decision.

To determine the differential impacts of the innovative crop-price insurance product and the financial education, IPA will employ a 2x2 randomized controlled trial. Farmers in Mumuadu's catchment area who are not currently loan clients will be randomly divided into one of four groups:

1. Farmers who are only marketed the normal Mumuadu loan product
2. Farmers who are only marketed the Mumuadu loan product with crop price indemnification
3. Farmers who first go through financial literacy training, then are marketed the normal Mumuadu loan product
4. Farmers who first go through financial literacy training, then are marketed the Mumuadu loan product with crop price indemnification

Prior to the marketing of the loans, Mumuadu employees will collect information on the farmers relating to their credit history, risk perception, financial management skills, and cognitive ability. Farmers' take-up of loans and repayment rates will be tracked over time. A follow-up survey will be conducted after 2-3 crop cycles to determine the impact of credit on households, the impact of the product on farmers' decision to take a loan, and the impact of financial trainings upon farm outcomes and decisionmaking.

D. Financial Education with non-credit clients (leveraging panel survey)

MFIs are rapidly expanding the range of services offered beyond credit, adding products such as savings, insurance, emergency loans, housing loans, and even retirement accounts. As competition between MFIs increases, the array widens even further of products choices clients have. Where once entrepreneurs needed only to choose between the exorbitant moneylender and the MFI, clients must now decide between competing loan offers at different terms and interest rates. As an example, MFIs differ on how they advertise and calculate their interest rates: some charge over the declining balance, others always charge over the initial loan balance.

It may be that microentrepreneurs do not fully appreciate the tradeoffs they are making. After all, people in rich countries make many imperfect decisions about money management too. Economics and psychology provide many potential explanations, such as self-control, inattention, poor planning, or simply valuing present consumption that much more than future consumption. Financial education may be able to help poor households and poor entrepreneurs make better financial decisions by helping them manage their money better, understand the implication of the choices they make, and thus make the optimal choices regarding their use (or not) of financial services.

We have two main questions:

1. How do individuals choose what financial services and products to use?
2. How do individuals make the best use of the products to which they have access?

Financial literacy could play an important role in the lives of the poor with respect to these questions. These are relevant not just for micro-enterprises but for household finance as well.

We aim to answer the first-order question, “Does such training work on average?” But our real goal is to dig deeper. We need to know the following in order to form context and organization-specific policy prescriptions:

- Under what conditions does financial literacy training work best?
- What types of organizations are best at implementing the training?

- Which elements of financial literacy are most important to teach?
- What pedagogical approach is most successful?
- What type of client receives the biggest impact?
- How will literacy impact elasticities to product features?

To learn the answers to these questions we will conduct randomized controlled trials in which we offer different models of financial literacy training to the general adult population (not just clients of a specific program) and a control group which is not offered training during the study period. Then, using the Yale Economic Growth Center panel dataset we can follow up with a rich dataset to determine the impact of financial training (and particular types of training) on household welfare and financial decisionmaking. In some cases, in particular e.g., interest rates, we will offer the training to individuals who then later will be offered credit at randomly different interest rates (in conjunction with the earlier described OI interest rate study).

IV. <u>Integration of Structural Frameworks and Experimental Field Methodologies</u>

Throughout this project we will combine experimental results with detailed survey data. The main goal is to estimate both the impacts of the actual experiments carried out, as well as asking out-of-sample policy questions regarding other potential innovations which could be carried out but were not. As noted by Todd and Wolpin (2006), using structural models alone to predict impacts of policy innovations is suspect because it is hard to test the validity of the model. Partly as a response to this issue, it has become more popular to randomize policy experiments. The limiting factor in this case is that experiments usually test only one policy innovation at a time and are expensive as well as time consuming.

Combining structural analysis with experiments, one can estimate a structural behavioral model and validate it by using the results of the experiment. Given this exercise is successful, one can then ask out-of-sample policy questions which would be impossible to credibly answer otherwise. In this effort, we can emphasize the synergies between structural estimation and randomized experiments – two areas of research which have, thus far, seen little overlap.[5]

As an example of how we will combine structural analysis with the experimental results, consider the health insurance project discussed in Research Question #1, Part C and Research Question #3, Part A. We will first construct a simple structural model with the following decision variables: going to a doctor, purchasing medicines, and enrollment in health insurance. There are two types of individuals: a sick type and a healthy type. This type is known only by the individual. Other variables which would be necessary for estimation include income shocks faced, health shocks faced (including health status even when individuals do not go to the doctor), and risk aversion.

We will fit this most simple model using the control group, which does not have a health insurance option. Then we can see how well the model predicts what happens in the groups which have been offered health insurance. (Enrolling in health insurance merely changes the budget constraint as well as the cost of going to the doctor and buying medicine.) Given the model does a good job of prediction in the non-control groups, we can measure the severity of adverse selection in voluntary health insurance enrollment.

Given the model accurately predicts outcomes in both the low-premium and high-premium groups, we can then ask questions about the impacts of other interventions which were not tried. These interventions include emergency insurance covering only procedures costing more than some minimum, insurance which does or does not cover prescriptions, and insurance with or without a co-payment. We will analyze how these different policy interventions affect both selection into insurance and consumption flows of the insured.

This simple model can give us quite useful information, but we can expand this model in two ways. First, we can add additional decision variables such as loan size and repayment rates for individuals

[5] Notable exceptions to this rule include Kaboski and Townsend (2007), Lise, Seitz, and Smith (2005), and Todd and Wolpin (2006).

who have access to microfinance institutions. Second, we can add the decision variable of transfers to or from friends and combine this with network data.

This first addition will allow us to measure the effect of risk rationing on microfinance outcomes. Estimation of this model will be more complicated than the original model because of its dynamic nature. Still, the methodology does not change: we first fit the model to the control group, then see how well it predicts loan take-up and repayment for the low and high premium treatment groups, and finally predict the effects of various insurance schemes as well as more flexible loan repayment schemes on loan size and repayment rates.

The second addition will allow us to measure the extent of crowd-out of informal insurance networks due to the introduction of formal health insurance. Again, we will fit the model using the control group, see how closely the model predicts informal borrowing or lending in the low and high premium treatment groups, and then predict the effects of different insurance schemes on informal insurance networks. While Rosenzweig and Wolpin (1994) and Cox and Jimenez (1992) find evidence of informal insurance crowd-out in the US and the Philippines, these papers do not make use of experimental results. We have the advantage that we will be able to exploit the experiment to calculate the magnitude of the crowd out of informal insurance arrangements due to the availability of health insurance.

The results from these exercises predicting the effects of untried policy innovations on adverse selection, loan take-up and repayment, and informal insurance crowd out, will obviously be useful from a substantive policy perspective. This is because they will allow us to predict which interventions will have the largest impacts at least cost without actually having to try each alternative.

The results will also be useful methodologically. This type of exercise has been rare thus far. Adding in borrowing and repayment over time, as well as informal insurance and interactions in such networks complicates the analysis. Designing a methodology for addressing both of these serious concerns, and applying and validating the methodology, will be an important step forward for impact analysis.

V. Conclusion

Our proposal seeks to make methodological and substantive advances in the practice and evaluation of expanding access to credit, savings, and insurance, and then work on critical dissemination of these results to organizations, financial institutions, regulators, and policymakers worldwide.

Methodologically, we seek to continue to develop research designs that combine field experiments and data collection. We seek to demonstrate that such designs: a) deliver scientifically rigorous answers to the substantive questions of interest; b) are replicable at low cost, meaning that the methodologies can be used to deliver rigorous answers that have demonstrated external validity, and c) can be combined with structural modeling in order to provide more complete theoretical understanding of markets and households, and when applicable and appropriate, out of sample extrapolations based on structural parametric estimates.

Substantively, our projects seek to address three layers of related research questions. The first set of questions asks about the mechanisms underlying the demand and supply of financial services. Understanding mechanisms and related market failures is critical to addressing our second set of questions: which specific innovations work to expand access, and which do not. Our third set of questions takes a more comprehensive approach to the issue of viable innovations by combining detailed micro survey data with administrative data from MFIs to evaluate the impacts and welfare effects of specific interventions.

Replication and external validity are critical themes to our proposal, overall research agenda and mission as an organization. By developing replicable methodologies, and then replicating them in multiple countries, settings, and markets, we hope to break through many of the puzzles that remain for policymakers in need of better prescriptions for expanding and improving the quality of financial access for the poor.

As the budget below indicates, BASIS funding is particularly critical to two expenditure categories not commonly emphasized in field research. (1) IPA's mission is to translate gold-standard research into policy and practice, and BASIS funding would support our dissemination of methodological and substantive findings to policy and practitioner audiences by funding a substantial part of the time, staff, and survey work needed to create plain-language summaries of our research and make related presentations at conferences and policy workshops. (2) We also have set aside funds for training of ISSER junior researchers, to train them in experimental methodologies, typically by attending the Jameel Poverty Action Lab executive education programs that take place 2-3 times per year.

Our partnership with ISSER is critical for this component as well, since we must reach international policy audiences in order to maximize the impact of the work on actual organizations, regulators and policymakers.

VI. ANTICIPATED OUTPUTS

The proposed research will answer several critical questions for microfinance practitioners and policymakers in Ghana and worldwide. Our outputs will be academic publications, plain-language research summaries targeted to practitioners and policymakers (including donors), and presentations at practice- and policy-oriented conferences. The institutions involved in this proposal have direct vested interest and experience in ensuring that the research findings influence actual policy and practice.

Academic publications: Our previous BASIS-funded projects have produced five academic papers so far (and three more are under revision for dissemination shortly). This project will produce several more, e.g.:

- "Interest Rate Elasticities of Demand for Credit Around the World"
- "Interest Rate Elasticities of Demand for Savings Products Around the World"
- "Savings Puzzles and Solutions: Evidence from Replicated Randomized Trials Across the World"
- "Returns to Capital: Evidence and Implications for Microcredit"
- "The Impacts of Microinsurance on Poor Households and Informal Markets: Evidence from Randomized Health Insurance Expansions"
- "The Impacts of Financial Literacy Education on Poverty and Demand for Financial Products"
- "Testing Structural Models of Credit with Experimental Results"

Plain-language summaries ("focus notes"): Each academic paper will be translated into a 1-3 page summary written for practitioners, policymakers, and donors. We also will produce focus notes that summarize findings across projects. For example, we will produce a focus note on "Interest Rate Sensitivities" and "Microcredit Impacts" that summarizes findings from all such projects.

Presentations: With USAID's help, we plan to continue to present our methodologies, evidence, implications, and related speculation to audience of practitioners, policymakers, and donors worldwide. We have made recent presentations of related work at the venues below, and plan to continue similar dissemination efforts under this proposal:

- Asian Development Bank

- BASIS/CRSP USAID conferences
- CGAP
- International Finance Corporation (A World Bank Group)
- The Microcredit Summit
- Microlinks Cyber-Conference on Group vs. Individual Lending Liability
- New York University Mini-Conference on Microfinance
- University of Michigan Conference on Microfinance
- The World Bank
- Federal Deposit Insurance Council
- Federal Reserve Board
- Federal Reserve Bank of Boston
- Federal Reserve Bank of New York
- Federal Reserve Bank of Philadelphia
- Federal Trade Commission
- BREAD (Bureau for Research and Analysis of Development)
- Village Bank Foro IV (IADB Annual Latin American conference)

VII. **BENCHMARKS**

Training, Collaboration and Capacity Building

Benchmarks:

- Junior researchers from ISSER attend a five-day Executive Education program on experimental methodologies for program evaluation.
- Coauthored with Aryeetey and other ISSER researchers.
- Two representatives from microfinance institutions attend a five-day Executive Education program at JPAL.
- Eight graduate students (two per year) trained on methods of randomized control trials and fully participate in field work.

Partner Research Institution (ISSER):

We intend to develop further our working relationships with ISSER by continuing to coauthor papers and involving our Co-Investigators in executive education trainings and short-term visits to collaborate on study design and analysis. Ernest Aryeetey has already been working for years with researchers at Yale, and in particular collaborating at length on the surveys that are underway and on the evaluation of the MCC compact to Ghana (which is the funding source of the 7,000 additional households in waves one and two of the planned panel surveys). We see this BASIS grant as a mechanism to expand the collaborative relationship to the wider set of researchers at Yale, ISSER, and IPA.

Through our partnership with the M.I.T. Jameel Poverty Action Lab, we will include some of our international partners in the Executive Education programs run over the summer in the United States, and developing countries such as Nigeria and India. This five-day program on evaluating social programs provides a thorough understanding of randomized evaluations and pragmatic step-by-step training for leading one's own evaluation. While the course focuses on randomized evaluations, many of the topics, such as measuring outcomes and dealing with threats to the validity of an evaluation, are relevant for other methodologies. In past years, we have had academics from overseas, donors, practitioners, graduate students, and newly hired research assistants participate in this course. Through the BASIS grant, we will include our overseas partners, both research and practitioners, in one of these programs over the summer each year. For more details on this course, please see the website: http://www.povertyactionlab.org/course/. We will also host our Co-Investigators in New Haven at Yale University for short-term visits, such as a few weeks or months, to work on analysis and writing of papers. We also envision inviting not just the researchers but some of the practitioners (i.e., senior management from partnering or potential partner financial institutions) to the Executive Education program at JPAL (some have already attended and reported much excitement about implementing what they learned for program evaluation work).

Graduate Students:

Our BASIS proposal includes funding for up to eight graduate students to work over the four years. The students will be based at ISSER at the University of Ghana. ISSER has a long history of hosting graduate students and conducting policy-oriented research, but does not have a history of conducting field experiments. Ideally this BASIS grant will additionally give us the opportunity and funding to get ISSER's own affiliates and students involved in IPA-led experiments as well. Many of ISSER students have expressed interest in graduate study in the United States in economics, agricultural economics, anthropology and sociology, and this experience should help them determine the appropriate career path for them.

Policy Integration

Benchmarks:

- 8 Academic papers.
- 8 research/policy short briefs to explain findings in plain language.
- Present findings at 10-15 academic institutions per year.
- Present findings at 5-10 academic conferences per year.
- Present findings at 5-10 policy conferences per year.

The mission of our subcontractor, Innovations for Poverty Action (IPA), is to work with organizations and policymakers world-wide to put the lessons of academic research into practice. IPA works to replicate and scale successful interventions, and to discourage unsuccessful ones. As such, IPA will work to ensure that our findings will be properly translated and disseminated to organizations, donors and policymakers worldwide so that microfinance programs can improve their sustainability and targeting, and hence maximize their overall social impact. With partners in numerous developing countries worldwide and professional linkages to relevant policymakers and practitioners, we are well poised to disseminate important findings through the right channels. We will also welcome advice and support in reaching a broader audience with our findings.

With the support of BASIS funding we will author approximately eight academic papers (two per year) that will offer key policy prescriptions based on scientifically rigorous evaluations. These academic papers will mainly be read by other researchers and analytically-oriented practitioners. They will serve an important purpose by spelling out details of the studies, generating credibility, and helping to develop a literature that we hope will attract additional research by others. Our papers will be submitted to academic journals (with, on average, a two-year publication lag), but, importantly, they will also be disseminated to decision-makers in a short, digestible form: for each academic paper we will write accompanying research/policy briefs. These briefs will be a main vehicle for distilling major lessons to policymakers. They will be non-technical briefs (1-3 pages) and accessible to a broad audience. Each brief will discuss lessons learned around access to and impacts of credit, savings and insurance for the poor. Furthermore, with BASIS support, we will make formal presentations of our findings to key policy forums and institutions.

Our findings will be presented at key policy forums throughout the course of our research. Please see Anticipated Outputs above for a list of forums to which we have presented our work in the past. With BASIS funding we envision presenting at these and other forums over the next four years. As a research team we anticipate giving 10-15 seminars at academic institutions, 5-10 presentations at academic conferences, and 5-10 presentations at policy conferences per year.

Achievement of USAID Objectives and Development Impact

Benchmarks:

- Policy prescriptions that respond to the USAID Initiative Foreign Assistance Framework's objective of reducing barriers for the poor to enter business.
- Policy prescriptions that respond to the USAID Initiative to End Hunger in Africa's focus on improving strategies to help the poor smooth consumption and reduce vulnerability to shocks.
- Policy prescriptions that will inform Millennium Challenge Corporation evaluation.

Our proposal is closely aligned with a number of USAID goals and activities and will directly support their achievement. Ghana is one of the partner countries of the Initiative to End Hunger in Africa, which aims to reduce hunger by promoting agricultural growth and increasing agricultural investment by small-scale farmers. Our proposed research clearly works towards this goal, and Ghana is an important setting for these interventions: 52% of Ghana's population lives in rural areas and 44% of the rural population lives below the poverty line.[6]

Specifically our findings will help us better understand the barriers the poor face to entry into business and will offer insight into mechanisms that work (and do not work) for reducing those barriers. Vulnerability to shocks is also a central focus of our research in all countries and our findings will fill in

[6] World Bank, Ghana Poverty Reduction Strategy, February 2003.

critical gaps in our understanding of how to help the poor to accumulate assets, and obtain credit and insurance, in order to mitigate the impact of shocks.

The USAID/Ghana Strategy Statement[7] states that its program supports the larger USAID Strategic Framework for Africa, including fostering a healthier, better educated, and more productive population. Several projects in this proposal contribute to this outcome, including health insurance, financial literacy, credit, and crop insurance. Additionally, USAID/Ghana's strategy statement cites aid effectiveness as a cross-cutting theme, one to which the results of our research will have much to say. We plan to reach out to the USAID Ghana mission to introduce staff to our work and share the results of our research.

At the international level, the research addresses two of the five priority areas of the Foreign Assistance Framework (FAF): investing in people, and economic growth. The FAF is intended to inform policy and programming interventions across USAID countries. IPA exists for exactly this purpose—we will replicate this research in other countries and take the findings from Ghana and other settings to inform practitioners and policymakers about which strategies are effective in different contexts.

With respect to the Millennium Challenge Corporation (MCC), our work we hope will link directly to work being done by MCC through one of several channels. First, one of the PI's, Ernest Aryeetey, is co-leading the evaluation team of the MCC's compact in Ghana. This includes an important financial services component, and the work we are doing both in Ghana and elsewhere can and should help to inform that initiative about how best to maximize impact, as well as provide useful methodological ideas for how to evaluate the MCC compact. Second, in Madagascar, one of the PI's (Karlan) is leading the evaluation (through J-PAL) of the agricultural extension component of the compact. This component likewise has a financial services component, and lessons learned from the work proposed under the BASIS grant should and will be useful both in the design of the intervention and its evaluation. Lastly, the PI's of this grant have worked with MCC staff through the Executive

[7] http://www.usaid.gov/gh/mission/css/ghana_strategy_statement.pdf

Education program mentioned above (MCC staff have attended the J-PAL Executive Education, and J-PAL also has conducted a specialized training for MCC staff at their location). Given the dedication of the MCC to randomized controlled trials, work we are doing to further the methodological strength of such approaches can and should help the MCC in its design work around the world, and we plan to continue our work directly with MCC to help communicate and consult to them in these efforts.

6. SCHEDULE OF ACTIVITIES

- October 2007 – January 2008:

  - Staggered launch of pilot surveys.

- February 2008 – August 2008:

  - Staggered launch of all baseline surveys and beginning of data collection.
  - Include international researchers in Executive Education at JPAL (Summer, 2008, 2009 and 2010)

- September 2008 – September 2009:

  - Complete data collection for short-term projects (i.e., those without follow-up surveys)
  - Data cleaning and analysis of results for short-term projects.
  - Complete papers from shorter-term projects.
  - Write focus notes from shorter-term projects.
  - Preliminary analysis of data for long-term (i.e. those requiring follow-up surveys) and large scope projects (e.g., multiple-site studies). These analyses will inform the structure of our follow-up surveys and direct the expansion of our larger projects.

- October 2009 – April 2010:

  - Staggered launch of follow-up surveys and project expansion.

- May 2010 – May 2011:

  - Complete papers for long-term and large-scope projects.
  - Continued data collection to measure long-term impacts. Studies to be extended into this fourth year will be determined based on viable evidence of program impacts.

- June 2011 – September 2011:

  - Write and disseminate focus notes for policy community, including practitioners, donors and regulators.

8. RESEARCH QUALIFICATIONS

Ernest Aryeetey

Professor Ernest Aryeetey is the Director of the Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana, Legon. He studied Economics at the University of Ghana and obtained a doctorate at the University of Dortmund, Germany in 1985. Ernest Aryeetey's research work focuses on the economics of development with interest in institutions and their role in development, regional integration, economic reforms, financial systems in support of development and small enterprise development. He is a member of the Board of the United Nations University World Institute for Development Economics Research (Helsinki) and also of the Board of the Global Development Network (New Delhi). He is a Member of the UNDP Advisory Group (New York) and sits on the Programme Committee of the African Economic Research Consortium (Nairobi).

Dean Karlan

Dean Karlan is an Assistant Professor of Economics at Yale University. After working in Latin American from 1992-1995 for a microfinance organization (FINCA International), Karlan returned to graduate school to study the economics of financial markets in developing countries in order to do research that provides better prescriptions for institutions and policymakers. From 2002-2005, he was an Assistant Professor of Economics and International Affairs at Princeton University in the Department of Economics and the Woodrow Wilson School of Public and International Affairs. Karlan is President of Innovations for Poverty Action and a research fellow of the M.I.T. Jameel Poverty Action Lab. His research focuses on microeconomic issues of poverty, specifically employing experimental methodologies to examine what works, what does not, and why, with a focus on microfinance. Studies have included interest rate policy, credit evaluation and scoring policies, group versus individual liability, savings product design, credit with education, and impact from increased access to credit. His work on savings typically uses insights from psychology and behavioral economics to design and test specialized products. He has consulted for the World Bank, the Asian Development Bank, FINCA International, the Millennium Challenge Corporation, and the Guatemalan government. Karlan received a Ph.D. in Economics from M.I.T., an M.B.A. and an M.P.P. from the University of Chicago, and a B.A. in International Affairs from the University of Virginia.

Justin Oliver

Justin Oliver is the Country Director for Innovations for Poverty Action in Ghana. He has an MPP from the Kennedy School at Harvard University. He received his Master in Public Policy from the Kennedy School at Harvard University in 2005. He has been in Ghana for over one year now, and manages several projects, including loan interest rate sensitivities, commitment savings products, and indemnified loans for smallholder farmers, amongst others.

Laura Schechter

Laura Schechter is an Assistant Professor of Agricultural and Applied Economics at the University of Wisconsin in Madison. After receiving a BA in Development Studies from UC Berkeley she worked for two years from 1996 to 1998 with the Peace Corps as an agricultural extensionist in Paraguay. The insights she gained from that experience were useful in shaping her way of thinking in graduate school as she completed her PhD at UC Berkeley in Agricultural and Resource Economics. Schechter's research lies at the intersection of development economics, behavioral economics, and contract theory. In particular she focuses on the interrelated areas of trust and trustworthiness, and risk and vulnerability. She has consulted for the World Bank with regards to her work on vulnerability. Recent studies include an analysis of the relationship between trust and risk, the informal contracts villagers use to prevent theft, and the value of social networks for mitigating exposure to risk.

Jonathan Zinman

Jonathan Zinman is an Assistant Professor of Economics at Dartmouth College and Research Fellow at Innovations for Poverty Action. He joined the Dartmouth faculty in 2005, having worked previously at the Federal Reserve Bank of New York. He obtained his PhD (economics) from the Massachusetts Institute of Technology in 2002, and his B.A. from Harvard (government) in 1993. In between he worked as a strategic analyst and loan fund manager for the Massachusetts Community Development Finance Corporation. Professor Zinman's research interests focus on consumer and entrepreneurial choice with respect to financial decisions. His substantive interests focus on testing economic theories of how firms and consumers interact in markets, and on testing the merits of incorporating specific features of psychology into economic models. His methodological interests focus on developing randomized-control field experiments and survey designs that generate clean tests of economic theories in real firms and markets. His applied interests focus on working with financial institutions to improve pricing, products, marketing, and risk assessment strategies, and on testing whether such initiatives are actually profitable for firms and beneficial to their clients. Professor Zinman currently is working with financial institutions across four different continents on research that leverages synergies between theory and practice.

Emmanuel Joseph Mensah

Emmanuel Joseph Mensah is a Principal Research Assistant at ISSER, University of Ghana, Legon. He obtained his first degree in Agricultural Economics (B.Sc. Honors) in 2001 and continued to serve as a Teaching and Research Assistant on national service at the Department of Agricultural Economics and Agribusiness at the same University in 2002/2003 academic year. Following that Emmanuel worked with the Ghana cluster of the United Nations University Project on People, Land Management and Ecosystem Conservation (UNU-PLEC) as a Junior Research Assistant and Secretary, a responsibility that led to a deep involvement in various research projects bordering on biodiversity and sustainable rural livelihood in the Northern, Upper East, Central, Greater Accra and Eastern Regions of Ghana. Until his enrolment as graduate student at the Department of Economics, he again worked on contract basis for numerous research projects within the University of Ghana and other firms including TechnoServe Ghana. Emmanuel presently holds the M.Phil. degree in Economics, aside other certificates in specialist programmes mainly on the monitoring and evaluation of development interventions. He is actively involved in the research activities of ISSER and shows strong research interest in issues of poverty and the economics of sustainable development in developing countries.

Robert Darko Osei

Robert Darko Osei is a Research Fellow in the Economics division of the Institute of Statistical, Social and Economic Research (ISSER), of the University of Ghana, Legon, Accra. Before joining ISSER, he lectured at the Ghana Institute of Management and Public Administration (GIMPA) also in Accra, Ghana. Robert, in the past worked full time as a research associate with the Centre for Research in Economic Development and International Trade (CREDIT) of the school of economics in the University of Nottingham, UK. His research interest covers a range of economic policy concerns, mainly capital flows, fiscal policy issues, poverty, trade and development, natural resource economics and social security in Ghana. Robert was part of the team that developed the MCA-Ghana program, as the lead economist. He is currently part of a team from ISSER developing a micro-simulation model for Ghana as part of a WIDER/UNU effort to build capacity in the use of such models for policy analysis in Africa. He has consulted for both local as well as international organizations, including Barclays Bank UK, Newmont Ghana Gold, JICA, Government of Ghana, Oxford Policy Management, UNDP, World Bank and the World Institute for Development Economics Research of the United Nations University (WIDER/UNU). Robert holds a degree in Economics from the University of Ghana, an MSc. in Quantitative Development Economics from Warwick University, UK and a PhD from the University of Nottingham.

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