1. TITLE PAGE

ENHANCING SMALLHOLDER COMPETITIVENESS IN THE FACE OF GLOBALIZATION

An AMA proposal developed by

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2. ABSTRACT

Smallholder farming has been the institutional structure for some of the most effective historical contributions of agriculture to economic development. Yet, this very social structure is under threat as globalization, trade liberalization, and the development of integrated value chains for food communities progresses. Guatemala has an unusually large smallholder sector with a strong indigenous base engaged in labor intensive non-traditional exports. This project analyzes three institutional innovations with potential of increasing the competitiveness of the smallholder sector: fair trade, the linking of insurance to credit, and use of credit bureau information in microfinance lending. Fair trade will be analyzed in terms of consumer demand in the United States, supply response in participating cooperatives, and incidence of benefits among participating and non-participating cooperatives. The linking of credit to insurance will be analyzed through the rollout of the national agricultural insurance program and a micro-lender deployment of a new insurance scheme. Use of credit bureau for borrower graduation to commercial lending will be done through cooperation with several of the major lenders in Guatemala, extending a long run panel work previously initiated with Basis support. In all cases, the project combines sound identification strategies with the use of administrative data, and collaboration with the private sector. Results will provide an unusual combination of benefits: opportunities for collaborating institutions (fair trade agencies, producer cooperatives, and microfinance lenders) to improve their products, information for regulators and policy makers to improve public policy design, and training opportunities for students in Guatemala and the United States.

3. NARRATIVE DESCRIPTION OF THE PROJECT

SMALLHOLDER COMPETITIVENESS AND GLOBALIZATION

Smallholder farmers face a deeply uncertain future in the face of globalization. The enormous returns to scale present in participating to high value chains, the subsidies received by OECD farmers, and a weak infrastructural and institutional environment all contribute to threatening the competitiveness of smallholder agriculture when it is exposed to the forces of trade liberalization and globalization. In the face of these challenges, it often appears that the only choices they have are to rent out to agribusiness concerns and become laborers on their own land, or to exit the industry and migrate out of rural areas altogether.

In this proposal, we set out a research agenda to explore a group of recently-emerged institutions which offer the potential of enhancing the competitiveness of smallholders in the face of the massive changes implied by liberalization and globalization. We focus specifically on three innovations:

- The emergence of niche markets for high value products, in particular the Fair Trade (FT) movement.
- The linking of credit to insurance to enhance the demand for credit.
- The use of credit reporting bureaus by microfinance lenders.

While there is much enthusiasm and a great deal of narrative evidence about the promise of these options, well-identified statistical studies are few. This is what we will pursue in this proposal.

We believe that our research team in Guatemala faces a unique opportunity to gain high-quality statistical identification in the study of these innovations for several reasons. First, Guatemala itself provides an excellent natural laboratory because it combines widespread smallholder farming with a rapidly growing high-value agricultural export sector. Secondly, we have a substantial research infrastructure built up with collaborators in Guatemala during the four years of the initial BASIS grant. This infrastructure includes contacts with universities, the Ministry of Agriculture and the Ministry of Finance, the National Association of Cooperatives, and all three of the lenders who are currently extending innovative financial products to smallholders.

Finally, because CAFTA will come into effect during the course of the coming year, we will be presented with a substantial shock to import and export prices while collecting data in the field. This will provide an exogenous source of identification of the impact of these options in shielding smallholders from the potentially adverse consequences of globalization.

RESEARCH STRATEGY AND DATA COLLECTION

Our research strategy is based on (1) specific research designs that allow identification of the phenomena under study, (2) access to institutional data, and (3) specific institutional collaborations that give us both access to information and to influence in decision making at the private and public policy levels.

(1) Research designs for identification

To the extent that institutions or supply networks are common to the whole country of Guatemala, we have no cross-sectional variation to use for the identification of impacts. Hence, the fruitful empirical questions lie in the study of institutions that have both spatial and temporal variation, and particularly in those whose pattern of rollout is either exogenous or randomized. This approach will be used to analyze the participation of cooperatives to the Fair Trade option, and the linking of insurance to credit by financial institutions. Another technique is to use randomization in exposing agents to a change. This will be used in working with supermarkets in varying the signals conveyed to consumers about the environmental and social services offered by Fair Trade.

(2) Access to institutional data

Another technique which has proven fruitful in our past research in Guatemala is the use of long term administrative data from the collaborating institutions under study. This has been uniquely effective in helping us analyze the entry of microfinance lenders into a credit bureau and the impact on their clients. For our next research phase, we are organized to collaborate with the cooperatives that market many of the high-value export crops. These long-standing organizations keep records on quantities and prices for past harvests that will allow to analyze the impact of participation to Fair Trade on supply response. The key to working with institutional data is a close spirit of collaboration in the research, and ensuring that the project is answering at least some questions that the

institutions themselves have. Preliminary discussions have indicated a strong level of interest among the cooperatives in answering the basic questions of the efficacy of new contracting arrangements. The drawback of the use of institutional data is that it tends to lack a rich socio-economic detail. For this reason, the data will be complemented by household surveys.

(3) Institutional collaborations

First, we will continue our collaboration with the Universidad Rafael Landivar, including participation to our research projects of a number of their faculty and graduate students. The Landivar University is a very effective platform to reach policy makers, with important entries into the Ministries of Finance and Agriculture, a large network of graduates in the private sector, as well as platforms where public policy issues are being debated.

Second, we have been in discussions with the director of Transfair, the U.S. certification agency that operates in Guatemala for imports to the U.S. about setting up a collaboration that will allow to study the impact of certification on cooperatives, as Transfair extends its coverage.

Third, we have received an enthusiastic offer to collaborate in future research from FUNDEA, an innovative financial institution which provides not only loans but crop insurance to financial cooperatives. They have demonstrated willingness to experiment and we are confident that a less ambitious research design than the one we had tried with them in the previous project (perhaps a synthetic staggering of new projects across branches) would have real promise.

Fourth, through the previous BASIS project we have a trained and organized a group of collaborators at the Landivar University which is able to run experimental games in the field. Because this team (directed by Tomas Rosada at IDIES/URL) is in place we will be able to conduct additional field work with relative ease.

We will continue working in close collaboration with Bruce Wydick and Elizabeth Katz, from USF. Bruce Wydick was part of the previous BASIS collaboration on microfinance, and Elizabeth Katz has particular interest in Fair Trade coffee and high-value crop, and has extensively worked in Guatemala.

Finally, we have continued access to the Genesis administrative records on their clients, including their credit bureau records. This sustained collaboration will give us the unique opportunity of long term client panels to analyze graduation from microfinance lending to commercial lending, one of the major determinants of smallholder competitiveness in capital intensive high value activities. This database will be extended by collaborative agreements with Banrural, the privatized state agricultural lending bank which has hundreds of branches covering the entire country.

RESEARCH SUB-PROJECTS

(1) FAIR TRADE AS AN OPPORTUNITY FOR SMALLHOLDER COMPETITIVENESS

Fair Trade (FT) coffee has seen explosive recent growth. A market which did not exist in 1998 saw 30 million pounds of coffee traded in 2004 and 65 million in 2006. New supply has been relatively easily created, because a single certification allows a subset of producers to receive a higher, guaranteed price for every unit produced. Unless the price margin given to farmers exactly equals the additional demand in the market for the social benefits of free trade, there will be excess supply or demand in the market. They ways in which FT price signals will alter the long-run equilibrium of these markets has not been well developed at a theoretical level. We suggest several reasons why, if these markets are not sufficiently structured, they will fail to deliver any benefit to producers. Empirical analyses which let us compare the targeting, impact, and risk effects of fair trade against other transfer mechanisms are practically non-existent. We suggest a multi-pronged research agenda to address these questions at the level of the supply chain, the consumer, and the producer.

1.1. Analysis of the coffee value chain

An important first level of analysis is to measure the pass-through of the producer price floor on the consumer price. While the minimum prices of $1.26/lb and $1.41/lb that licensed FT importers have to pay to farmers for conventional and organic coffees, respectively, have been substantially above the international market price over the last few years, they still represent a small share of the retail prices (of say $5-12/lb). Many large importers and retailers carry both fair trade and non-fair trade products, and hence

should not have different intermediate cost for both types of product. Other importers and retailers are specialized in FT. The FT movement often claims that with less intermediary costs than in the standard value chain, FT coffees are not necessarily more expensive than non-FT coffee. In the first phase of our project, we will thus conduct an analysis of price formation along the FT and non-FT value chains that connect Guatemala and the rest of the world.

It is very relevant to compare the pass-through in FT with the share of other aid delivery mechanisms that is eaten up by administrative costs. An advantage of FT mechanisms may be precisely the fact that they piggyback on existing supply chains and so present an efficient means to transfer income from the rich to the poor.

1.2. What do consumers demand from Fair Trade?

FT represents an interesting phenomenon on the demand side because, in the extreme, neither product nor process attributes differ, and the only difference between FT and non-FT products is the price that the producer receives. As coffee is a highly differentiated product, there is no clear indication that the premium that consumers pay for FT coffee is either lower or higher than the markup received by the producer.

This premium, which reflects the willingness to pay for FT, is a direct monetization of preferences for a specific form of support to equity. Economists have long preferred to use revealed preference rather than stated preference, and the willingness to pay for an FT product provides just such a metric. It is thus of real interest to understand the demand curve for such transfers.

Theoretical framework

To fix ideas, take a market prior to the introduction of free trade. This market clears at equilibrium price P_0, with resulting inverse demand $Q_0(P_0)$. When FT is introduced we have two heterogeneous goods on the market, whose only differential attribute is the transfer to the producer. If the price of non FT coffee is P_n and the 'fair trade premium' is f, then the fair trade price is $P_f = P_n + f$.

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Assume that consumers realize an additional 'charity' benefit b from the consumption of a unit of the FT product. Those willing to pay the premium will be those for whom $V(P_n + f) + b > V(P_n)$, where $V(.)$ is an indirect utility function.

One simple set of assumptions is that people are heterogeneous in b but otherwise have the same utility functions. In this case, selection into the FT market arises as a result of high charity valuation. In the institutional study of the various possible delivery mechanisms for charity (national aid organizations, private charities, personal gifts, etc.), what causes consumers to choose to use this one? Our customer survey will include questions about other forms of charitable giving which (although self-reported) will allow us to answer this question.

A more interesting theoretical model is to assume that b is constant across agents and so heterogeneity arises from differences in the price elasticity, inducing a difference in $V(P_n + f) - V(P_n)$, which we can write as V'. In this case, the consumers who purchase the FT product are those whose demand for coffee is the most inelastic. Thus, even in a partial-equilibrium context where the non-FT price is unaffected by the introduction of FT, we will see that the demand curve for the non-FT product becomes less steep as a result of the introduction of the FT market. The surprising and important implication is that the creation of an FT market creates an incidental form of output insurance for producers that make the non-FT variety of the good, because price responds more strongly to quantity. A corollary of this change is that it will become more difficult to hold together a cartel in the non-FT market because price is less responsive to quantity. The straightforward empirical implication is that non-FT consumers should be more price sensitive, a hypothesis which is readily tested using price point data in combination with experimental price variation, or measured directly by surveys.

Another basic demand-side question is whether the aggregate quantity consumed in equilibrium (of both FT & non-FT) increases or decreases. If there is a perfect one-for-one substitution effect, then $\dfrac{dQ_n}{df} = -\dfrac{dQ_f}{df}$ and there is no quantity effect of FT on non-FT markets. There is an interesting theoretical ambiguity here, however. The income effect present in the higher-priced FT product would predict that the non-FT quantity consumed should decrease as the FT quantity increases. To the extent that FT

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products embody an opportunity for transfer that has some inherent value to consumers, however, this will drive up aggregate consumption of the good because it now carries an additional attribute, and thus total consumption of the good may increase.

We plan to approach the empirical analysis with two methodologies: the estimation of an hedonic price and a marketing experimental design, complemented with a consumer survey.

Hedonic price analysis

The hedonic price analysis consists in relating the observed price to the characteristics of the purchased good. This requires a good characterization of the product itself, in addition to the other elements that correspond to the preference of the consumer (packaging, trade mark, process such as organic production) and the Fair Trade label. In the case of coffee, the observable characteristics displayed on the package are few and not systematic. In particular, many FT coffees fall under a relatively generic category of blend coffee, without country of origin and much characterization of the coffee itself. We therefore plan to collaborate with a group of coffee experts from CIRAD (Center for International Cooperation in Agricultural Research for Development), an organism of the public French bilateral aid system, to obtain taste characteristics of the coffee itself. The analysis will reveal the premium attached to the Fair Trade label, separately from the organic characteristic that is often combined in the product. Another interesting aspect of this analysis is to reveal how much information the Fair Trade label carries, compared to the use of other self-reported characteristics that suggest farmer friendly links between the importer and producers used by many competitors.

Marketing experiment and a consumer survey

Due to a research relationship with a supermarket chain located across the Western United States (with concentrations in Arizona, California, Colorado, Oregon, Texas, and the state of Washington), we expect to be able to enter into experiments in which we alter the perceived characteristics of FT products and observe the consumer response through their purchase. Following a methodology that we have previously used

to obtain consumer attitude information in conjunction with a marketing experiment with our contact super-market chain, we plan on a short exit survey to reveal some characteristics of the individual consumers that purchase FT and non-FT coffee. The two most straightforward margins on which we can adjust information on product attributes are the consumer price markup and the nature of the FT product. We can alter the messages sent with FT marketing, including the share of the transfer that makes it directly to producers, the size of the premium, and the degree to which 'organic' and other process attributes are associated with the product.

This not only provides valuable information in marketing for FT producers, but allows us to measure several interesting demand parameters as well. First of all, what is the price elasticity of generosity? In other words, what fraction of people are willing to make a direct transfer of their own income to others, and what are the characteristics associated with a propensity to generosity?

1.3. The supply side of Fair Trade

Fair trade markets must be held in permanent disequilibrium in order to generate rents for producers. We can model FT as a market that takes the following form: producers sell a contract whose only differential attribute is that it will transfer all of the rents generated in that market to the producers of the product. The price on the FT market is a negative function of the quantity produced both because of the slope of the normal demand and because there are fewer people who wish to transfer large quantities of income than those who want to transfer less.

If producers are price-takers and the costs of producing the FT and non-FT product do not differ, then farmers who are unconstrained in what they sell will produce only FT if the output price of FT is higher. This will push up the quantity of FT produced until we have price parity.

In order to hold the FT price above the market price, then, licensing and certifying institutions must in effect be offering a cartel. At present a body called FlO-cert is the single international clearing house for the international registration of FT-certified cooperatives, and so provides the most obvious mechanism for such a cartel. Given the number of insitutions that are able to produce FT, the supply-chain intermediaries who

set the percentage of the output of a certified coop that can be sold at the FT price are then arbitraging between two markets. In the normal output market they have no pricing power, but in the FT market they possess some oligopoly pricing power. This suggests that in order for the free-entry, zero-benefit scenario for FT to be avoided, we must have constraints both on the amount that individual producers can sell at the FT price and on the number of intermediaries who have the ability to certify producers.

Let us assume that agency problems have been overcome and collusion can be sustained in this market in the long run; what is the socially optimal contract? Using aggregate profit as a guide, we can imagine a single welfare-maximizing social planner or a cartel of producers making output decisions for the FT market. The substantial fixed costs of certification for each producer represent a destruction of income in the aggregate, and so for efficiency purposes we wish to certify as few producers as possible. However, from an equity perspective we wish to spread the benefits as widely as possible, and so we should certify numerous producers. The optimal contract in this context is therefore a function of willingness to pay for redistribution *between* producers, just as the underlying demand for FT represents WTP for redistribution *to* producers. This discussion begs the empirical question of how FT is targeted between producers at present. The question of targeting is of more interest than usual in this case, because it goes to the heart of whether FT is the optimal delivery mechanism (meaning that it supplies the most benefit to worthy parties at the least cost) for the 'donors'.

Surveys

Our surveying proceeds in several waves; we begin with a census of cooperatives, then we move to a two-wave survey of a sample of the cooperatives, and then to a two-wave survey of households which are members of cooperatives.

The targeting question cannot be addressed empirically unless we start from a meaningful population. This is provided by a Census of Cooperatives which IDIES/URL possesses. A very large share of the cooperatives have telephone access, and the first field component of the project is a telephone survey administered in Spring 2008 to every cooperative in the census. Here we will get baseline information about whether they what they produce, whether they participate in FT or organic production, and whether they take credit or insurance as well as basic characteristics of the organization, From this

census we can draw a sample weighted toward FT producers and, for Section 3, towards cooperatives which use insurance.

In the summer of 2008 we will conduct a longer, more detailed survey on a subsample of cooperatives, which will include social capital and trust questions, the bylaws of the cooperative, and GPS coordinates. This first cooperative survey will form a baseline for subsequent studies which introduce random or quasi-random variation into the rollout of FT and insurance products The census combined with a more detailed sample will allow us to study the *de facto* targeting of FT in different markets, a distribution which can be compared to transfer programs of different kinds.

Using our sample of cooperatives to draw a sub-sample of households which do and do not have access to the interventions studied in the proposal, we will go to the field in Summer 2009 to conduct a baseline household survey. This will study farm gate prices and output decisions, as well as a standard set of household outcomes, among a group of households that have not yet had access to FT certification. By tracking who then achieves certification in the future, we can run probit estimations to back out the targeting rule, and compare the profile of FT recipients as compared to those who receive CCTs in Mexico or other similar cash transfer programs to understand how the targeting process differs.

In Summer 2010 we will conduct the followup for both the cooperative and household surveys. This gives us a two-year window in the cooperatives (which are long-lived, easily tracked institutions) and a one-year window in households through which we can measure changes introduced by the experiments we conduct in collaboration with Transfair and FUNDEA. Both of these samples can be weighted back to being representative of the population of cooperatives in Guatemala.

Creating Identification through Program Rollout.

Within the pool of producers that want to become certified, we can work with the certification agency to create experimental variation in the sequence in which they are certified. With the survey of cooperatives in hand, we can stratify this rollout across the characteristics of the cooperatives. Transfair has expanded over time, currently having certified six coffee cooperatives (ADIPCO with 260 members, ASASNAPE with 230, ASOBAGRI with 614, COMAL with 496, and Manos Campesinas and Nahuala with

126), as well as other commodities apart from coffee. The rapid ongoing certification of the cooperatives provides panel variation. Paul Rice, president and CEO of Transfair, has expressed enthusiasm to collaborate in helping answer the impact questions. By performing the follow-up survey partway through this rollout process, we will have a randomized trial that allows us to assess the impact of the FT premium on household outcomes.

Using these data, an additional set of questions can be addressed:

- How do the household impacts of a unit of transfers received through the FT mechanism compare to the impacts measured through programs such as Progresa or AFDC?

- Are non-fair trade farmers expanding output at the same rate as fair trade farmers? If it is the case that producers only sell a fraction of their production at the FT price, access to FT does not change the marginal price to the producers. Yet, with pervasive market failures for credit and insurance among smallholders, a pure transfer can induce a supply response. This leads us to measure whether access to higher prices is triggering the supply response that economic theory would predict.

- Is there knowledge or hostility on the ground about who is and is not receiving the fair trade price? What do the farmers understand to be the rules of the game?

- What are the environmental differences on the ground between the ways that farmers produce the different kinds of coffee. When the prices for coffee rise, do they clear new land or use more mechanized methods of production?

Another crucial component of the FT coffee market is that the FT price is fixed while the market price fluctuates underneath it. This requires us to think about utility maximization by risk-averse producers, who will have an additional incentive to get certified & produce FT coffee. Ironically, in this case FT would replace the standard 'low risk, low yield' crop in models such as Carter (1997). Cooperatives might even be willing to become certified when profits from doing so were negative, with that loss seen as a premium paid on the insurance provided by the fixed FT price. The household surveys will thus be focused on risk-sensitive behavior.

We can also add a great deal of institutional richness through understanding how FT and quality certifications interact. Goods such as coffee are subject to fine quality and price gradations, but the FT prices do not reflect this variation; there is a single price per pound for organic FT coffee and a single price for non-organic FT. This introduces an incentive for farmers to sell their lowest-quality product of each type as FT, reserving the high-quality output for the non-FT market where quality is priced in. Thus FT markets may work, in effect, through quality discrimination rather than through price discrimination: people buy bad coffee because they know it does something good. Because the cooperatives keep detailed information on the quality grades and prices at which they have sold, we will be able to examine this phenomenon empirically, comparing the trajectory of what is sold at FT and non-FT prices.

Collaboration with the Guatemala USAID mission.

Together, USAID's Global Development Alliance and Starbucks have committed one million dollars to the Farmer Support Program in Guatemala, whose aim is 'to increase access to credit, encourage sustainable coffee growing practices, improve environmental and social conditions in coffee growing communities, and support the implementation and measure the impact of C.A.F.E (Coffee and Farmer Equity Practices) practices in selected locations'. There is an obvious alignment of interests between their project and our proposal, and team members from Landivar have been in communication with the Health and Education staff from USAID Guatemala's mission to discuss how our efforts could reinforce each other by mutually leveraging data and identification to improve both projects.

(2) DOES INSURANCE ENHANCE THE DEMAND FOR CREDIT?

A well established result in development economics is that financial constraints can impede the competitiveness of smallholder farming (Boucher, Carter and Guirkinger, 2006). This can be due to lack of collateral preventing access to credit, but also to risk rationing when smallholders refrain from demanding credit not to place their collateral at risk. Hence understanding how credit and insurance products can be structured to reach this market is crucial. Then, once these products are in place, are agricultural producers able to improve the profitability of the crops that they produce? In this respect as well,

Guatemala provides an interesting source of variation. In this component of the project we will investigate the intersection of agricultural credit and insurance, and test whether they foster the ability to produce high-profit crops.

Statistical Identification for Insurance Impacts.

In 2004 the Guatemalan government introduced an agricultural insurance program known as Dacredito, which provides subsidized reinsurance to commercial banks. The insurance payouts are based on the regional output of the crops covered under the insurance program, and the primary intent of the program is to protect small farmers from the risk imposed by large natural disasters such as hurricanes.

At present, several large banks have begun to offer insurance products backed by the Dacredito guarantee, but the primary issuers of insurance policies have been the supply-chain intermediaries who currently provide seeds, fertilizer, and transport services to cooperative farmers. There is now a push on to try to extend these insurance products further down the supply chain, so that they are being offered directly to smallholder farmers. This provides a unique opportunity to work with the financial institutions providing this insurance to create variation that can be used to identify impacts.

Several current studies of insurance measure the impact on mean household incomes. We argue that this is not the most relevant outcome in a study of insurance, since the mean impact of having insurance depends almost entirely on the state of nature which obtains during the period of study. Perhaps a more interesting question, and certainly one which lends itself better to a short-term statistical study, is the extent to which the presence of insurance makes producers more willing to use complementary output tools such as credit, high-value crops, and so on. Our ability to combine variation in insurance access with a rich set of complementary institutional data allows us to test these complementary impacts of insurance.

The variation in insurance access will come in two dimensions. The first is the expansion of Dacredito across financial institutions, which will create temporal and spatial variation in the time at which cooperative are able to protect themselves against specific output risks. The backcast panel available from the cooperatives institutional data will let us measure impacts from the non-experimental rollout of the insurance program, particularly insofar as it has discontinuous impacts on producer behavior.

In order to get high-quality identification on the longer-term impacts of the insurance, we will work with FUNDEA which is in the process of introducing their own insurance program for clients in order to inject identification into the process of rollout. Preliminary discussions indicate that this organization is willing to attempt randomized designs in order to learn how to calibrate its insurance program. The fact that the impetus is now on pushing insurance down to the individual level is fortuitous, because it will create just the kind of fine-grained treatment control structure that lends itself to statistical analysis. We anticipate working with FUNDEA to create a randomized rollout of the ordering in which their component branches begin to offer the insurance product directly to cooperative farmers, and measure the intention-to-treat effects of this process.

We will bring a wide range of data sources to bear on the analysis of this expansion of insurance. They are:

- **Institutional Data and Survey of Cooperatives**

Since the primary decision making unit for many agricultural lending and insurance questions is the cooperative, we can leverage our cooperative survey for the analysis of both projects. This survey will allow us to observe how the cooperatives interact with the agricultural supply chain, and will give us an opportunity to add institutional richness to the analysis. We can also use the institutional data of the cooperatives to answer questions of crop choice, quality grades, prices, and output. Because institutional data will typically not contain good proxies for social capital, trust, knowledge, and other more subtle covariates, these variables will be collected through surveys at the cooperative level.

- **Institutional data from nationwide agricultural/microfinance lenders.**

We expect to use aggregated data (at the administrative unit/month level, for example) to establish a spatial map of the lending history of two lenders: Banrural, the privatized national development bank, and FUNDEA, a non-profit microfinance lender. We can also use the rural communal bank portfolio from our extant Genesis data. This combination of sources gives a panel at the branch/month level that allows us to ask questions about the aggregate quantity of credit, the number of borrowers, and the average repayment performance, etc.

- **GIS and other secondary data**

From URL/IDIES, we have access to the poverty maps, several national censuses, and recent election data. We will use GIS data, commonly referenced at the municipal level, as the grid for the data assembly. This gives us a baseline of control variables that can be used to explain initial conditions. Using geo-coded data on the location of the cooperatives, we can calculate local averages (or use municipalities) to map other forms of data on to the cooperative survey and the household survey.   Geo-referenced branch-level data from the lending institutions & insurers would similarly allow us to measure impacts across institutions as contracts change. This gives a rich set of outcomes and covariates that can be used to deepen the study of the variation in insurance coverage.

2.1. Impact of insurance on participation to high value activities

The institutional data from the cooperatives will allow us to test whether insurance is enabling a transition to more high-value cash crops over time. In a coffee cooperative, for example, we can analyze the impact of insurance on the quantities of different grades produced and the prices received, and hence allow us to observe improvements in profits.

2.2. Impact of insurance on the demand for credit

Data from the lending institutions is ideal for studying the ways in which the deepening of insurance markets may lead to a corresponding expansion of credit markets, particularly if there are discontinuous impacts of the interventions. The institutional records of the insurance rollout will provide us with a similarly nuanced variation in the treatment effect. This suggests that even in the event that we are unable to create experimental variation in the provision of insurance, there may be a great deal in this relationship with which to inform theory.

For example, a basic test of the rationale behind the Boucher-Carter risk rationing hypothesis is that the absence of insurance provision to borrowers is a factor that impedes the uptake of credit. Hence, we should observe that, precisely when this component of variation is removed from agricultural risk, lending will increase on both the intensive and extensive margins. Second, we will be able to obtain disaggregated lending data for

some lender(s) which, combined with basic information about the households and regions, can help answer questions such as: Is the impact of insurance greatest in regions that have the largest rainfall variation? Is it larger in regions that have economies that are less diversified away from agriculture?

Risk reduction via insurance can also change the contractual arrangements through which unsecured loans are obtained from microfinance lenders. For example, if an attraction of group loans had been the degree of insurance induced by joint liability, we should see that the share of individual lending in the MFI portfolio increases as insurance improves. We can also answer a pragmatic set of questions about the role of insurance on the performance of lending institutions. This can be done by looking at the financial fundamentals of the lending institutions such as overall default rates, employee efficiency, and retention rates are of interest to the longer-term financial sustainability of these markets.

If the cooperatives have keep high-quality panels that go back before they received loans, then we may be able to use the historical patterns by which the lenders rolled out to identify the impact of credit on the supply chain and cropping patterns of the cooperatives.

(3) MOVING UP THE LENDING LADDER WITH CREDIT BUREAU PORTABLE SIGNALS

Through our previous Basis project, we have developed a sustained collaborative relation with Genesis, the largest microfinance lender in Guatemala. This association has been mutually beneficial, helping Genesis understand how credit bureau information is used by credit agents and how it affects client behavior, and helping us understand the efficiency and welfare gains (and losses) from introduction of a credit bureau in microfinance lending. One of the main questions raised by introduction of a credit bureau is whether this helps clients use their accumulated reputation with a microfinance lender as portable signals, made available through the bureau, to gain access to more loans and to loans from the commercial banking sector. Because this is a long term process, we were only partially able to trace out this impact on the Genesis clientele. We would like to use this new Basis grant to sustain this relationship over the length of the project. It will give a unique long term panel on microfinance clients, allowing to trace

the impact that availability of portable signals will have on their moving up the lending ladder. The data base will be extended with access to Banrural data (at the branch level) and to Fundea data a the individual level, both members of the same credit bureau. Some of the Genesis clients are smallholders. Many more smallholders are present in the Banrural and FUNDEA lending portfolios, allowing us to see if a credit bureau contributes to smallholder competitiveness, in the context of the on-going globalization and trade shocks. Data analysis will be complemented by detailed case studies conducted by Master's students at the Landivar University and the University of San Francisco working as teams.

ANTICIPATED OUTPUTS AND BENCHMARKS

The anticipated outputs consists in:

(1) Research results that will provide both a better understanding of the opportunities offered by institutional innovations for the competitiveness of smallholders in the context of globalization: access to niche markets such as Fair Trade, linking credit to insurance, and using credit bureaus to provide public signals about good borrower behavior. These results will have three uses: (1) help guide the private sector collaborating institutions to improve the products they deliver, (2) provide valuable information to regulators and policy makers in designing policy reforms and public investment programs for these institutional innovations to be more effective in enhancing for smallholder competitiveness, and (3) serve as materials for a series of academic publications. We expect that the public policy platform offered by the Landivar University will be particularly effective in reaching policy makers. We have good personal contacts with some of the highest government officials in Presidency, the Ministry of Finance, and the Ministry of Agriculture.

(2) Training of students in Guatemala and the United States. Students from the Landivar University, and most likely from University of San Francisco and UCSD, will collaborate in fieldwork, case studies, data collection, and data analysis. Several Master's theses in those institutions will be developed using this information. In addition, the project will provide opportunities for PhD dissertations at the University of California at both Berkeley and San Diego.

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Credit Bureau follow-up
Oct-Dec 2007:   Follow up study of longer-term impacts of credit bureau.

Fair Trade Demand
Oct-Dec 2007:   Value Chain study (Students from USF/UCSD)
Jan-May 2008:   Experiment and survey in US supermarkets
Oct-Dec. 2008: Hedonic analysis

Cooperatives (Fair Trade and insurance projects)
Jan-May 2008:   Cooperative phone census
Jun-Sep 2008   Case studies of cooperatives
                Baseline cooperative survey

Oct-Dec. 2008: Beginning of quasi-random rollout of insurance with FUNDEA

Jan-May 2009:   Preparation of GIS database
                Targeting analysis of FT

Oct-Dec. 2009: Beginning of quasi-random rollout of certification with Transfair

Oct-Dec. 2009: Merging of institutional, GIS, and cooperative data.

Jan-May 2010:   Collection & digitization of cooperative institutional data
                Re-collection of institutional lending data
Jun-Sep 2010:   Follow up cooperative survey
Oct-Dec. 2010: Presentation of cooperatives results in URL conference.

Fair Trade household analysis
Jun-Sep 2009:   Baseline FT household survey

Jun-Sep 2010:   Follow up FT household survey

Oct. 2010- June 2011: Analysis of household surveys
                Presentation of cooperatives results in URL conference.

RESEARCHERS QUALIFICATIONS

Alain de Janvry is professor of Agricultural and Resource Economics and in the School of Public Policy at UC Berkeley. He has extensive experience with issues of rural development in Latin America. He is currently serving as co-director of the World Bank 2008 World Development Report on Agriculture for Development.

Craig McIntosh is assistant professor in the Graduate School of International Relations and Pacific Studies at UC San Diego. He is an expert in microfinance and has expertise in the impact analysis of development projects.

Tomas Rosada is the current director of the IDIES and has done research on microfinance institutions and rural development in Guatemala. As director of IDIES, he has extensive contacts with the private sector and policy makers in Guatemala.

Elisabeth Sadoulet is professor of Agricultural and Resource Economics at UC Berkeley. She has published extensively in international development, ranging from macroeconomic and trade issues to household behavior and institutional economics.