Quantitative Impact Evaluation: MCC-MCA Nicaragua Compact

The BASIS Assets and Market Access Collaborative Research Support Program (AMA CRSP) aims to improve the agricultural competitiveness and quality of life of the rural poor in the developing world through policy-relevant research that is dedicated to improving access to resources and enhancing the operation of factor markets. The AMA CRSP also has a strong commitment to seeking out opportunities to partner with donors and development practitioners to build research activities that complement program implementation with the express purpose of improving impact analysis to improve further program rollout and inform broader development practices. BASIS researchers, including program Director Michael Carter, have a long standing research interest in Nicaragua, and specifically in the substantive areas outlined in the MCA-Nicaragua Compact. We have substantial expertise on land issues, and access to land and other resources is one of the four main research areas of the CRSP.

The following methodology is proposed for the impact evaluation. The Principal Investigator may propose additions or changes to this methodology. By mutual agreement between USAID, on behalf of MCC, and the Principal Investigator, the methodology may be revised or updated.

The overall impact evaluation strategy for Nicaragua has four major topics. The work BASIS is proposing will focus on assessing the impact of the property rural business development program and the regularization activities in urban and especially rural areas. The data that will be collected for these assessments will permit some modest inference on water supply issues and the impacts of roads. While analysis of these issues and impacts will not be a major focus, BASIS will work with MCA-Nicaragua to make sure that all data collection efforts support the collection of baseline data for all impact assessments. We will also work closely with MCA-Nicaragua to ensure sound evaluations in all areas.

Impact Evaluation Strategy

Both the Property Regularization Project and the Rural Business Development Project are hypothesized to increase incomes and asset values for individuals who benefit from these programs. Letting y indicate an outcome variable of interest (*e.g.*, family income, land value, etc.), the goal of the evaluation is to estimate the impact of a project treatment T (land titling only, business services only or both together) that is implemented after time period 1. This impact can be defined using the following difference-in-difference expression:

$$D^T = [\,(y_2^T - y_1^T) - (y_2^C - y_1^C)\,]$$

where D^T is the project treatment impact, the subscripts indicate time (1 is the time before the treatment; 2 is the time after the treatment) and the superscript C indicates values for the counterfactual or control group. In words, the treatment effect is defined as the change in y (e.g., income) that an individual

experiences following the treatment less the change in less the change in *y* that that the same individual (or an adequate control person) would have experienced over the same time period without the treatment.

Treatment Regimes and Detailed Hypotheses

A number of countries, including Nicaragua, have invested in land titling programs with the idea that land titles will promote broadly based growth. The evidence on these programs *in isolation* is mixed. By combining a land titling with a business services program, the Nicaragua program opens the door to understanding the impact of land titling both in isolation and in combination with business services. In particular, the program will permit observation and evaluation of the following four treatment regimes:

	Without Business Services	*With Business Services*
Without land title	(i)	(ii)
	[late/late]	[late/early]
With land title	(iii)	(iv)
	[early/late]	[early/early]

Ideally, the goal would be to randomly allocate eligible program beneficiaries between these four treatment regimes. Comparison of treatment group (iv) with (control) group (i) using the difference-in-difference estimator sketch above would permit identification of the full impact of the Nicaraguan program. Comparison of groups (iv) and (iii) would permit us to see the additional value added to land titling efforts when they are combined with business services. The other pair-wise comparisons (iv with ii; and, ii with iii) would also provide valuable information on program effectiveness.

Control Group Strategy

The challenge of this and any other impact evaluation is to obtain an adequate control group. Because the benefits of the land titling program will be extended to everyone, a quasi-randomized program implementation strategy should make it possible to obtain adequate controls. Those receiving land titles early in the life of the program will serve as the treated (row 2 in the table above), while those receiving later in the program will serve as controls (row 1). PRODEP has already identified a geographic rollout strategy that will be adequate for this purpose. Unfortunately, this seemingly straightforward approach may have to modified slightly at the analytical stage as roughly 40% of the households in the late treated areas already hold more or less clear titles. These earlier titles were not randomly distributed and emerged from a demand-driven framework.

Identification of a control group for business services is more challenging as this program is demand driven—that is, services have to be requested and will not be extended to everyone. However parallel to the land titling component, business services will be rolled out at different times in different (quasi-randomly selected) areas of Leon and Chinandega. Households treated with business services (column 2 in the table above) will thus come from early treated communities, while those from late treated communities will form the controls.

To reflect this basic design, the table above contains a dual early/late designation for each treatment cell. The first indicator refers to the timing of land titling program. The second indicates the timing for treatment with the business services program.

Sampling Strategy

Random sampling of households within zones designated for early receipt of the business services program is unlikely to yield many direct project beneficiaries. In order to assure adequate representation of direct beneficiaries, a stratified random sampling will be used in *both* (early) treatment and control (late treatment) areas. The MCA office of business services will provide a simple *ex ante* scoring model that can be used to predict those households who are likely to take up the offer of business services. Information for the scoring model will be derived from the agricultural census, and the sample will be drawn from the universe of agricultural producer households listed in the census. Over-sampling households with high scores in both treatment and control areas will yield a sample which should include reasonable numbers of direct beneficiaries (or people in the control areas who will eventually become beneficiaries when the business services program reaches them. The sample derived this way will be called the *Ex Ante Sample*.

The full sample will NOT, however, be drawn from high score households alone. A portion of the sample will be retained for randomly drawn households from each area. The presence of these households will permit analysis of the spill-over of business services benefits to households that are not direct beneficiaries.

While the above strategy should work, it is possible that the ex ante scoring model will fail to accurately predict the demand-driven program take-up. To guard against this eventuality, a fraction (25%) of sample observations will be drawn from the list of those who actually enrol in the program. The characteristics of these actual beneficiaries will be used to modify the scoring model so that a similar *ex post* sample can be simultaneously taken in the late treatment/control villages. The sample derived through this procedure will be called the *Ex Post Sample.*

It is understood that some individuals from outside the specifically designated rollout zones will independently contact the rural business office and seek support. These individuals will not be included in the sample.

Survey Rounds

The first or baseline survey round will take place as soon as possible after the Rural Business Office is able to supply a scoring model and a geographic program rollout strategy. Ideally, the ex ante sample will be interviewed in April-May of 2007. The ex post sample will be interviewed as close to that time as is practical. However, the exact timing of that sample will depend on the timing and speed of the actual program recruitment.

The second survey round will take place approximately two years after the baseline (April-May, 2009). The exact timing will need to be coordinated with the implementation plan of the rural business office. The idea is to have the second round surveys take place before business and titling programs are extended to the 'late' areas. Analysis of the second round data will permit identification of program effects.

Finally, a third survey round of data will be taken during the final year of the program (April-May 2011). By this time, households located in control (later treatment areas) should have been treated. This will

open the door to 'continuous treatment' methods in which variation in the extent of treatments (e.g., months with title; months with business services) can be used to identify program effect. This method (which requires that the extent of treatment is randomly determined) will permit a more extensive look at the dynamic effects of the Nicaraguan program. This should be especially important in terms of understanding longer term investment effects in both productive assets as well as human capital assets (e.g., children's education).

A very similar methodology can be used to assess the impact to urban households. The evaluation will compare urban households that receive regularized titles early in the Project to those that receive regularized titles late in the Project.

The treatment group will consist of those living in urban areas of Chinandega, because residents of Chinandega are currently receiving regularized land titles. The comparison group will be comprised of those living in León, because León will receive the Property Regularization Project later than Chinandega. Comparison of treatment group with comparison group, using the difference-in-difference estimator sketch above, would permit identification of the full impact of the property regularization.

The National Institute of Statistics and Census (Spanish acronym INEC) has just completed a Living Standards Measurement Survey (LSMS). The households from Chinandega and León that participated in this survey will be re-visited with a short land module to complement the data gathered from the LSMS.

The first or baseline survey round will take place as soon as possible and be conducted by INEC. The second survey round will take place approximately two years after the baseline (April-May, 2009). The exact timing will need to be coordinated with the implementation plan of the Property Regularization Project. The idea is to have the second round surveys take place before the Property Regularization Projects are extended to the 'late' areas, i.e. urban areas in the Department of León. Analysis of the second round data will permit identification of early program effects. Finally, a third survey round of data will be taken during the final year of the program (April-May 2011). By this time, households located in control (later treatment areas) should have been treated. This will open the door to 'continuous treatment' methods in which variation in the extent of treatments (e.g., months with regularized title) can be used to identify the Project effect.

Budget Narrative

The primary costs for this project will be salary time for Michael Carter as PI, and a graduate research assistant. In each of the years when a survey will be conducted (Years 1, 3 and 5) a half month of salary time for the PI is charged, and a full year of a reseach assistant at a 50% LoE is charged. In the intervening years when more effort will be spent on analysis and dissemination of results, no PI time is charged, though he will participate in these activities, and the RA is charged for only 8 months. Salary rates increase at a projected rate of 3% per year, while benefit rates increase at a projected rate of 1% per year.

In addition to salary, there are several trips budgeted each year from Madison to Managua, and from Madison to Washington, DC. These trips allow for longer stays in Managua when there is a survey. In survey years there are two trips for the PI and four trips for the research assistant budgeted. In the intervening years, there is one trip for each to Nicaragua to participate in dissemination of results, and two trips for each to Washington to coordinate with MCC and present findings.

In the survey years we have charged $400 per year for communication costs. This will allow for communication with AMA staff while in the field, shipment of any necessary supplies, and other increased communication costs affiliated with their travel to Nicaragua.

Finally, in each year a flat fee of $8000/year is charged for payment of tuition remission for the research assistant. This is in accordance with University of Wisconsin – Madison policy. Note that no indirect charges are paid on this amount.

Indirect costs are charged at a rate of 47% in accordance with the University of Wisconsin - Madison federal NICRA. This amount is paid on all costs except for tuition remission, which is omitted from the modified total direct costs (MTDC) as noted on the budget.