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Abstract

Social investment funds, a widely used tool of development efforts, aim to support and strengthen local capacity for effective implementation of social and economic infrastructure projects through participatory, community-driven approaches. We investigate whether these participatory methods improve the outcomes of education projects and community members' perceptions of their effectiveness using data from an impact evaluation of the third phase of the Fondo Hondureño de Inversión Social (FHIS). We also make an important contribution with more carefully defined and explicit measures of individuals' participation in community projects. We do not find statistically significant effects of the education projects on academic outcomes of school-aged youth, but we do observe positive, statistically significant relationships between the use of participatory methodologies and household opinions of the projects, as well as between households' level of participation and their opinions of the projects.

INTRODUCTION

A prominent auxiliary goal of development and poverty reduction efforts currently supported by international financial institutions, developing country governments, and their bilateral partners is to improve state-society relations, local governing capacity, and the transparency of government activities in developing countries through the promotion of participatory institutions and processes. The basic idea is that supporting and strengthening local capacity for design, implementation and maintenance of social and economic infrastructure will also increase community ownership of and contributions to development projects, promoting their sustainability and effectiveness. One of the primary vehicles of these efforts over the last two decades has been the Social Investment Fund.

Social investment funds (SIF) are independent or semi-autonomous administrative entities, typically located within a ministry of finance or other central government unit, which support the selection, financing and execution of social and economic infrastructure projects intended to reduce poverty and address acute economic and social problems.[1] The first SIF was initiated in Bolivia in 1990 to succeed Bolivia's Emergency Social Fund (in operation 1986-1989) and alleviate the effects of the 1980s' adjustment policies (Jack, 2001). These institutions have since proliferated; Rawlings reported in 2005 that social funds had drawn close to US$10 billion in foreign and domestic financing globally and represented international financial institutions' most significant investment in community-led development initiatives.

The focus and design of SIFs have evolved over the last decade and a half, from an emphasis on shorter-term "social compensation" to longer-term strengthening of local

[1] SIFs typically operate outside line ministries and yet close and accessible to the country's presidential office. This autonomy is intended to free them from cumbersome bureaucracy, allow for greater transparency, and facilitate the hiring of personnel on a competitive basis.

governance and capacity, community empowerment, and maintenance/sustainability of basic services and infrastructure (http://web.worldbank.org/). A key feature of these "second-generation" SIFs is the promotion of decentralized, participatory decision-making and management of projects, with communities taking lead roles in planning, organizing, and contributing to their preferred subprojects. In a cross-country review of recent studies of SIFs, Rawlings et al. (2004) concluded that SIFs have been largely effective as an administrative tool for reaching the poor and underserved, with some funds successfully targeting the very poorest districts with resource shares greater than their population share. At the same time, we have accumulated far less knowledge about the impact of SIFs in increasing the welfare of the poor and the role of participatory, capacity-building features of SIFs in maximizing and sustaining these investments.

In this study, we investigate whether efforts to implement a participatory, community-driven approach to social investment fund projects improve the outcomes of these projects and community members' perceptions of their effectiveness in Honduras. We use data from an impact evaluation of the third phase of the Fondo Hondureño de Inversión Social (FHIS) to estimate the impact of FHIS III education projects on education outcomes/indicators and to explore the role of community participation in project development and execution. As in Bolivia, the Fondo Hondureño de Inversión Social was created as a program of social compensation for the effects of structural adjustment policies (by Law No. 12-90 on February 22, 1990). The FHIS has capital and administrative, technical and financial autonomy within the central government of Honduras; a Board of Directors chaired by the President of the Republic oversees FHIS, which is led by an Executive Director (with the rank of Minister). Initially, the law provided for a limited term of operations (five years), but 1994 reforms not only extended the term of FHIS but also transformed its mission to a broader focus on constructing and

strengthening social infrastructure and social capital and reducing poverty. The FHIS has since advanced to its fifth institutional phase, under the presidential administration of Manuel Zelaya (FHIS V).[2]

The third institutional phase of FHIS (1998-2002), which is the focus of this research, was specifically directed at improving and enhancing the mechanisms that facilitate the participation of communities in the processes of planning, execution and supervision of projects. Institutional decentralization and openness of these processes was advanced to increase local government and community participation and to expand their roles in the selection, execution and sustainability of projects. Unfortunately, the initiation of these activities was disrupted by Hurricane Mitch in 1998, which shifted the early efforts of FHIS III toward emergency reconstruction.[3] Later they were recommenced in pilot form, incorporating the community participation methodology known as the "Delegación Operacional del Ciclo de Proyectos (DOCP)." The DOCP involved the delegation of FHIS management functions (e.g., project formulation, contracting, and execution) to municipalities along with technical assistance, resource transfers and other supports to strengthen local capacity for project management.

A total of $337.7 million dollars (US) was invested in FHIS III projects by the World Bank, Inter-American Development Bank, the Honduran central government and other bilateral/multilateral partners.[4] The objectives of an impact evaluation of FHIS III conducted by

[2] FHIS V currently lists as its strategic objectives the following: (1) to improve living conditions of the poorest by offering greater access to basic social services; (2) to increase the sustainability of social investments by improving the quality of environmental and civil work in the projects and promoting municipal and community participation; (3) to augment the management capacity of local governments and their communities in order to facilitate the gradual transfer of participatory planning processes, operations management, and the maintenance of project work; (4) to strengthen the technical capacities of local businesses and nongovernmental organizations and encourage their participation in the cycle of projects and related activities; and (5) to promote equity and increased participation of women in decision-making and community development.

[3] In the first three months following Hurricane Mitch, all FHIS resources were dedicated to reconstruction.

[4] Just under one half of this total investment was directed toward emergency reconstruction and rehabilitation following Hurricane Mitch.

the firm Economia, Sociedad, Ambiente, and Ingenieria (ESA) Consultores (2005) were to determine if the project investments reflected the priorities of the communities and reached the poorest among them, if the works were of sufficient quality and accessible to the local population, and if local capacity and social infrastructure were strengthened through these investments. A sample of 120 FHIS III projects (education, health, water and sanitation, flooring and public works, e.g., roads) was defined as the principal intervention group for the evaluation; 80 projects that were in the "pipeline" served as a control group; 30 projects that were in the FHIS II pipeline were used to construct a baseline, and 32 emergency reconstruction projects were also evaluated. The DOCP methodology was used in 51 of these projects, with 44 of these 51 being sub-projects in education (ESA Consultores, 2004). Given that education sub-projects compose the largest segment of the FHIS III evaluation sample and the greater majority with the DOCP methodology, this study focuses specifically on evaluating the impact of FHIS III education sub-projects and the effects of these community participation strategies in Honduras.

Through an expanded and more methodologically advanced analysis of the data collected in the FHIS III impact evaluation, we have sought both to increase general knowledge of the impact of SIFs on social welfare and the role of decentralized, participatory methods of project management in increasing their effectiveness, and to improve our understanding of the specific effects of the FHIS III education subprojects and DOCP methodology in Honduras. We also make an important contribution to this literature with more carefully defined and explicit measures of individuals' participation in community projects that allow us to quantitatively assess the effects of participation on project outcomes. In general, we do not find statistically significant effects of the FHIS III education subprojects on the academic outcomes of school-aged youth in the project communities, but we do observe statistically significant relationships

between the use of the participatory, DOCP methodology and household opinions of the projects, as well as between households' level of participation and their opinions of the projects. We begin now by first discussing the literature on SIFs and the role and implementation of participatory methodologies, and we continue with a description of our study sample, data, methodology and hypotheses, followed by a presentation and discussion of our study findings.

BACKGROUND AND LITERATURE REVIEW

Social Investment Funds and community-driven development

A core principal underlying the current design and orientation of SIFs is community-driven development (CDD), in which control of decisions and resources is ceded to community groups that partner with local elected governments, the private sector, nongovernmental organizations (NGOs), and central government agencies to provide social and infrastructure services and improve governance and resource management, while simultaneously empowering the poor (The World Bank, 2002). There is no single methodology or set of rules/guidelines for successful CDD projects, although practically, CCD is expected to work best for projects that are smaller in scale and geographically focused, do not require complex technologies, and benefit from local cooperation (e.g., common pool and public goods such as surface water irrigation systems or local road maintenance.) CDD projects have also been advanced in areas where market organization and local government institutions are feeble and/or failing to support community development.

The World Bank reference guide for management of CDD projects (2002) notes that many SIF projects are appropriately characterized as CDD projects, although their methodologies for increasing community participation differ widely. Rao and Ibáñez (2005: 790) describe SIFs as "the most visible mechanisms of CDD assistance." As they explain, SIFs

and other CDD mechanisms are expected to produce a better match between projects selected and community priorities and needs than "top-down" development strategies, because communities participate in choosing projects and making related management decisions. Community participation in these activities is also intended to increase the utilization of local "know-how" and materials in project development, to employ local labor and provide opportunities for skill development, and to increase project sustainability with the corresponding strengthening of local governance and management capacity. As generalized by Cooke and Kothari (2001: 5), the broader aim of participatory development is to involve "socially and economically marginalized peoples in decision-making over their own lives."

Cooke and Kothari (2001: 7-8) also draw attention, however, to a set of shrewd critiques that challenge the conception that promoting community participation will consistently contribute to better development outcomes. The essays in their edited volume consider three elemental concerns: (1) Do participatory processes "override existing legitimate decision-making processes"? (2) Do the group dynamics involved in these processes "reinforce the interests of the already powerful"? and (3) "Have participatory methods driven out others which have advantages participation cannot provide?" For example, in his study of the Kribhco Indo-British Farming Project (KRIBP) in India, Mosse (2001) determined that participatory goals were more likely to be oriented outward or upwards, i.e., conditioned by expectations of project deliverables and justifying or validating higher-level objectives or mobilizing political support for them, rather than downwards, drawing from local knowledge and engaging diverse local interests. In the same volume, Cleaver (2001: 53) concluded that the emphasis on participation in development activities has in practice become more of a managerial exercise that draws from "toolboxes of procedures and techniques" and is disproportionately focused on efficiency. Arguing that most of the claims about the benefits of participation are yet unproven, Cleaver

called for more empirical analysis of the effects of participation and the linkages of participation of the poor to social and economic outcomes.

Evaluating SIF project impacts and the role of participation

Empirical analysis of the effects of CDD/participatory approaches on community involvement and project outcomes is complicated by both the wide variety of methods and strategies that are applied and the role of the community and cultural contexts in mediating their effectiveness. For example, some SIFs establish minimum requirements for community (and gender) involvement at each stage of project development and in various tasks, while others engage communities in setting their own targets. Some utilize committee-like structures and democratic methods of election/selection to facilitate representation, while others define attendance or verbal contributions in public meetings as indicators of participation or representation. Some CDD efforts construct more subtle incentives (social or economic) for participation, such as identifying participation with social responsibility and educating community members about the expected long-term economic benefits of participation. For others, access to and control of project funding and other resources may vary according to the extent to which participation goals are achieved, along with SIF donor requirements and local capacity for project management.

The significant challenges that the diversity of CDD/participatory approaches and the difficulty of fully observing them in practice present for the empirical evaluation of their effects are explicated in a multitude of studies (primarily case studies) that have accumulated since the early 1990s. For example, in their review of impact evaluations of social programs in Latin America and the Caribbean, Bouillon and Terejina (2006) indicate that a key element in SIF designs has been the requirement of adequate participation of women in all stages of project

cycles, and yet a number of studies have shown that participation in SIF projects by women has been insufficient and unequal in this region. Cleaver's (2001) study of a water and sanitation project in Tanzania suggests, however, that measuring participation by meeting attendance or voiced opinions might inadequately capture women's involvement. In the Tanzanian project, a large disparity was observed in the number of men and women speaking at public meetings that involved project decision-making. Further investigation showed that the women had intentionally chosen the most eloquent spokeswomen among them to express their views in these meetings, and in fact, their project preferences prevailed over those advocated by the men. The broader question of what empirical measures will appropriately capture the influence and engagement of women in these processes has been given scant attention in the literature.

In their review and synthesis of the findings from five SIF impact evaluations in Bolivia, Honduras, Nicaragua, Panama and Peru (with the evaluation of the FHIS in Honduras covering the longest period, 1990-1997), Bouillon and Terejina (2006) reported mixed results on the achievements of SIFs. Consistent with Rawlings et al. (2004), they concluded that SIFs are effective in targeting the poorer districts and municipalities with resources, although they offered only a vague report that in some cases, participatory approaches were not successful in involving local community members. Both Rawlings et al. and Bouillon and Terejina also described positive impacts of SIFs on social and economic infrastructure and outcomes, such as improved physical conditions in schools, reduced grade by age disparities in Honduras and Nicaragua, and increases in children's years of education in Peru. In addition, these studies have shown that investments in training for community members are important to the maintenance and sustainability of project work. In Honduras, water and sanitation systems constructed or rehabilitated by FHIS-funded projects exhibited significantly lower productivity, attributed in the evaluation to inadequate maintenance.

As Rao and Ibáñez (2005) point out, the existing research tends to embody one of two approaches: quantitative analysis that examines broader impacts of SIF interventions but is less attentive to social, cultural and institutional context, or qualitative analysis that gets inside communities and the CDD processes but draws primarily on information from beneficiaries that is subject to problems of selection bias, limits to generalizability, and the inability to draw causal inferences. In their own study, Rao and Ibáñez used both qualitative and quantitative data to evaluate the effects of the Jamaica Social Investment Fund (JSIF)[5], including its impact on participation and collective action in communities. Their qualitative data consisted of semi-structured, in-depth interviews with key representatives of five matched pairs of communities (with one community in each pair receiving JSIF resources), focus groups with community members, and field observations. Their quantitative data was gathered from questionnaires administered to adults in approximately 50 households within each of the (10) paired communities, yielding a sample of 684 individuals. As Rao and Ibáñez acknowledged, their data have several important limitations: semi-structured interview samples were nonrandom, access to JSIF resources was not randomly assigned, and pre-intervention (pre-JSIF) observations on the communities were not available. They attempted to adjust for possible selection bias by using data gathered from a series of retrospective questions on the household questionnaires (pertaining to the time period before JSIF was introduced) to predict (in propensity score matching) the probability that an individual belonged to a JSIF community.

Although we are not fully convinced that Rao and Ibáñez's approach to their quantitative analysis adequately addresses threats to the study's internal validity,[6] their research is unique in

[5] The Jamaica Social Investment Fund was instituted in 1996.

[6] The retrospective questions on their household questionnaire asked individuals to recall their levels of community participation and other information five years back, and we question whether these data, which are likely to be

this literature, and their qualitative and quantitative analyses yield consistent and interesting results that are worthy of discussion. Both components of the study showed that participation was not broad-based but rather limited to a relatively small group of individuals in the community, typically mobilized/motivated by a local leader. Their empirical analysis also showed that economically better off, more educated and better networked community members were more likely to have their preferred project selected. The authors characterized these JSIF CDD processes as "benevolent capture" or "informed top-down" (pp. 822-3). At the same time, most respondents reported that they were happy with the JSIF project in their community, which Rao and Ibáñez interpreted as evidence that CDD is actually more of a process of persuasion and learning than of broad-based community engagement. They concluded by cautioning that CDD processes such as that implemented in the JSIF and observed in their study risk exacerbating or perpetuating inequities in poor communities.

This review of the literature on SIFs and CDD suggests that to date, we have little and limited evidence of the role of participatory approaches in improving the outcomes of development projects targeted toward poor and underserved communities. We turn now to our analysis of the FHIS III in Honduras, in which we aim to advance our understanding of SIF impacts and the contributions of CDD to them.

DATA, METHODOLOGY AND HYPOTHESES

FHIS III evaluation sample and data

As indicated above, the Honduras-based firm ESA Consultores was contracted to conduct the evaluation of FHIS III.[7] An explicit focus of ESA's work on FHIS III was the measurement

tainted by recall error and response bias, can be confidently be used as a baseline measure in the propensity score estimation.

[7] ESA Consultores also worked on the FHIS I and II evaluations. A listing of their contracts and links to specific projects may be found at their website, http://www.esa.hn/.

of participatory aspects of FHIS and the responsiveness of the FHIS projects to both the expressed and perceived needs of the beneficiary communities. In the evaluation, ESA utilized information from FHIS's Sistema de Informacion Gerencial (SIG) to assess the progressiveness of the distribution of FHIS projects and the projects' impacts on their host communities.

In designing the study, ESA originally aimed to reach 264 communities, that is, 184 treatment communities with projects and 80 control communities, with 12 households interviewed per community (a target number of 3,168 households). The resulting sample included 252 communities, 172 with projects and 80 control communities, for a total of 3,015 households. Table 1 lists the project types and corresponding frequencies.

Table 1 shows that ESA identified control communities by project type. Control projects were chosen from a wait list of communities that had been selected to receive a FHIS project, but where project work was still pending. ESA also chose to sample projects that were in the "pipeline" in 1998, that is, projects initiated under the FHIS II program that had now been completed. Since our research focuses on the subset of education projects, the total number of observations available for our analysis is reduced (see Table 2, which shows the distribution of households according to the various types of education projects). Critical to our study, we are also able to distinguish between education projects implemented with and without DOCP (participatory) methods.

Project data (quantitative and qualitative) were collected from multiple sources, including schools, parent committees, and local authorities, in addition to households. Quantitative data obtained from households included typical demographic measures such as income, interviewee gender, family size and others. Two noteworthy aspects of this dataset were the measures of education and community participation. These measures were fairly complete, ranging from 78

to 100 percent coverage for the 899 children included within the household interviews. The education-related questions asked of each household produced measures of each child's age and grade (100% complete), annual school-related expenses (78%), the child's age at first matriculation (87%), reason for not attending school if they did not attend (100%), number of days missing in the last week (78%), commuting time to school (78%), and whether or not the child received a nutritional supplement at school (100%).

Similarly, the FHIS III data are relatively rich in participation-related information. Interviewees of every project type were asked whether they had attended planning meetings and/or participated in the implementation of the project through labor or cash support; whether they received sufficient education regarding the project, and of their opinions of the project and whether their preferred project type had been implemented. Checks of the interviewees' actual participatory role were also built into the questionnaire, such as the module specifically designed to test interviewees' knowledge of the FHIS projects. For example, interviewees were asked to identify whether FHIS had implemented one of the seven project types in their communities, and if so, where the funding was obtained, and whether or not they had been consulted regarding the project.

In comparing each interviewee's response to the actual project implementation records, we uncovered apparent discrepancies between reported participation and actual project involvement. For example, depending on the project type, between 12 and 36 percent of all interviewees in communities with finished FHIS projects incorrectly believed that they had not received a FHIS project, while an additional 1 to 11 percent were unsure about project implementation. For the education projects that are the focus of our study, these corresponding

numbers were 36 percent (incorrect response) and 2 percent (unsure) for participatory (DOCP) projects, and 34 and 11 percent respectively for non-DOCP projects.

Of particular interest to us were eleven variables related to the interviewees' presence in the community and their level of participation in the development process: the number of years in the neighborhood; whether they knew of the project school; whether they lived in the community when the project was implemented; the project type; two variables (from different sources) recording whether the school had a parent's committee; whether the interviewee had participated in parent committee meetings; whether the interviewee had gone to a pre-project meeting in order to obtain FHIS financing; whether their school distributes Family Allowance (PRAF) bonuses, and if the community had organized a project maintenance committee. Since complete information for all 796 households was available for these variables, we constructed a "participation index" by assigning each response a particular value and summing for each interviewee (see Appendix I for a more detailed description of this index variable). This index measure was used in our quantitative analysis as a broader and more comprehensive measure of household members' participation in the projects.

We also drew upon ESA's qualitative data to gain a fuller understanding of how these processes unfolded in FHIS III planning efforts. ESA conducted focus groups to collect more in-depth information on participatory activities, although only for 15 projects. We examined the qualitative data recorded from responses to open ended questions provided by parent committees, school administrators and local authorities, including municipal workers. Most notable from our review of these data was the wide range of responses regarding the perceived effectiveness of participatory processes, a diversity that was less evident in the quantitative data.

For example, consider the divergent views offered by parent committees in response to questions such as: "What were the responsibilities of the municipal government?"

> The Municipality solicited the project, executed and supervised the project, provided consulting services from its Technical Assistance Unit, and accredited the project maintenance instructor.
>
> Did not have any responsibility; (the FHIS file does not record any municipal participation).
>
> The municipality was no help at all.

Quantifying these answers was not feasible, but the variance in answers was nonetheless informative.[8]

In constructing the data for the impact evaluation of FHIS III, ESA Consultores randomly selected a sample of projects from among the 12,890 projects registered in the FHIS management information system (stratified by type, i.e., executed with DOCP, executed without DOCP, in the pipeline in FHIS II, emergency, and not executed as of May 2004). Random, stratified samples of households within the communities of these projects were then selected for administering household questionnaires.[9] However, the original assignment of projects to communities was not conducted using random assignment. Thus, although the selection of projects and subsequent sampling of households for the impact evaluation were performed randomly, the impacts of FHIS III projects should not be calculated using simple differences in outcomes between communities with executed projects and those without completed projects. In other words, one cannot assume the statistical equivalence of the treatment (i.e., those with

[8] The availability of qualitative information on household experiences with and perceptions of participatory processes also confirmed that the variance observed in interviewee responses to questions about their participation in the projects was not simply reflecting individuals' fatigue with the interview or complete ignorance of project details.

[9] The projects were selected randomly after being sorted according to "project type, specific sub-groups of each project type, the method of planning and contracting, and finally, the method of implementation" (ESA 2005).

executed projects) and comparison (i.e., those without completed projects) communities and the households within them.[10]

Study methodology

In our analysis, we are interested in estimating the effects of FHIS III education projects on two basic types of outcomes: academic outcomes (i.e., children's school attendance and grade repetition) and households' subjective assessments (or opinions) of the school projects, as measured in 2004. Simple descriptive statistics confirmed, however, that households in project (or treatment) communities differed from those in communities without completed projects. Households in treatment communities were significantly *less* likely to have a mother with more than a primary education ($p=0.0009$) or to have access to a public water source ($p<0.0001$) or electricity ($p<0.0001$), and they were significantly *more* likely to have a family member working as a laborer ($p=0.052$) and attending a school where the PRAF was offered ($p<0.0001$). In other words, households in project communities appeared to be more disadvantaged than those in the comparison communities (i.e., without projects).

In light of the observed differences between households in the treatment and comparison communities, it is important to use a method for estimating FHIS III project effects that adjusts for potential bias due to nonrandom selection of households into projects communities. In this study, we use both linear control function and propensity score matching methods to adjust for these differences. We began by estimating generalized linear mixed models for a binomial outcome, where household outcomes and opinions of the education projects are modeled as a function of household characteristics at one level, and the variation in outcomes and opinions

[10] To locate interviewees, ESA divided maps of the project communities into four sections and then selected three households from each (ESA 2004, 2005). Those homes in which the inhabitants could not be located, or in which a church or other inhabitant-less abode was found, were eliminated from the list without replacement, which may have also compromised the effort to produce random samples.

between households is modeled as a function of particular project characteristics at a second level. More specifically, the *level one sub-model*, shown in Equation [1], was estimated for a given binomial outcome ($\mathbf{O}_{ij}$), using a probit link function (probit $(p)=\Phi^{-1}(p)$), where X_{1ij} to X_{nij} are n household characteristics for household i served by project j[11]:

$$\mathbf{O}_{ij} = \$_{0j} + \$_{1j}X_{1ij} + ... + \$_{nj}X_{nij} \quad [1]$$

The *level two sub-model* was simultaneously estimated, using k project-level variables W_{1j} to W_{kj} that are hypothesized to explain the variation between households in their outcomes and opinions (as captured by the intercept of the level one sub-model, $\$_{0j}$):

$$\$_{0j} = (_{00} + (_{01}W_{1j} + ... + (_{0n}W_{kj} \quad [2]$$

A random-intercept model specification, in which all other coefficients in Equation [1] are assumed to be fixed (i.e., $\$_{1j} = (_{10}, ..., \$_{nj} = (_{n0}$), provided the best fit to our data. Our analysis also showed, however, that the generalized linear mixed models produced results that were nearly identical to a probit regression with robust, clustered standard errors. Thus, to facilitate ease of comparison of these results with those of the propensity score matching models, we report the marginal effects of the probit regression.[12]

We used econometric matching on the propensity score (that is, the estimated probability of treatment or of being in a community with a completed project) to remove bias associated with pre-intervention differences between the treatment and comparison groups. This method requires measures observed prior to the intervention (or measures of characteristics that are stable or deterministic with respect to time) to use in predicting treatment status and also makes

[11] In the equations, we do not show an error term, known as the "random effects" vector in the generalized linear mixed model, or $\hat{u}$; $\hat{u}$ can be obtained from the inverse of the link function.
[12] The results of the generalized linear mixed models are available upon request from the authors.

the strong assumption that there are no unobservable variables that influence both selection and the estimated outcomes (Imbens, 1999, 2004; Heckman and Navarro-Lorenzo, 2004; Smith and Todd, 2005). In this regard, we acknowledge that the FHIS III evaluation data are lacking. We rely primarily on measures of household characteristics that are stable or deterministic with respect to time, including a measure of time to travel to school[13], but we are not able to provide definitive evidence that there are no unobserved variables that might influence both selection (into a project community) and project outcomes or opinions.

Appendix II provides additional information about the propensity score matching estimation that was performed. Table II.1 shows that basic characteristics of households (whether they had access to water or electricity, the region in which they resided, and whether schools received the PRAF benefit) were the key predictors of whether or not they resided in a treatment community (i.e., with a completed project). The estimated relationships suggest that poorer or more disadvantaged households/communities, that is, without access to water and electricity and targeted by the PRAF, were more likely to be beneficiaries of completed projects. In addition, Figure II.1 and the simple descriptive statistics on the propensity scores below it show that there is considerable overlap in the propensity scores between households in the treatment communities (with completed projects) and comparison communities, with fairly broad ranges of propensity scores for both groups (0.159-0.876 and 0.079-0.841, respectively). At the same time, the pseudo R^2 value in the logistic regression suggests that there is still a considerable amount of variation in treatment status that is not explained by this model.

Research hypotheses

[13] Distance or time to school has been used as an instrumental variable in a number of econometric studies of the effects of schooling, although Altonji, Elder and Taber's (2005) analysis and review of related studies is generally negative on the utility of this variable as a source of exogenous variation for identifying schooling effects.

In describing our research hypotheses, we begin with our most basic hypotheses about the effects of school projects. As indicated earlier, there are five categories of projects: emergency, finished with DOCP (participatory) methods, finished without DOCP, not finished, and not executed. Based on these five project categories, we use two alternative measures of project effects: a single indicator variable that distinguishes emergency and finished projects from those that were not finished or not executed, and three indicator variables for the categories emergency, finished with DOCP, and finished without DOCP, where projects that were not finished or executed serve as the reference or base category. In general, we expect that if FHIS III education projects brought about significant improvements in educational opportunities and effectiveness in communities, we will observe positive effects of the implemented projects on school-aged children's academic outcomes.

> H_1: School-aged children in households residing in communities with finished and emergency education projects should have better academic outcomes than children from comparable (matched) households in communities without finished or executed projects.

In addition, if the participatory (DOCP) methods applied in some of the education projects were more effective in engaging the community residents in the development processes and promoting the quality and sustainability of the education projects as intended, we would expect projects with DOCP to have larger (positive) effects on school-aged children's academic outcomes than finished projects without DOCP or emergency projects.

> H_2: School-aged children in households residing in communities with finished education projects that employed participatory methods should have better academic outcomes than children from comparable (matched) households in communities with finished projects without DOCP or emergency projects.

We also expect that if finished FHIS III education projects brought about improvements in educational quality and opportunities in these communities, households residing in them will

have highly favorable opinions of FHIS III projects. In addition, if participatory methods of project implementation are more effective in engaging community residents and enabling them to make project decisions that are in the best interest of the community, we expect household opinions of projects implemented with DOCP methods to be more favorable than emergency or finished projects without DOCP.

> H_3: Household opinions of FHIS III projects should be more favorable in communities with finished and emergency education projects than those of comparable (matched) households in communities with projects not finished or not executed.
>
> H_4: Household opinions of FHIS III projects should be more favorable in communities with finished education projects that employed participatory methods than those of comparable (matched) households in communities with finished projects without DOCP or emergency projects.

If the analysis of FHIS III education projects shows that finished projects with DOCP (participatory methods) are more effective and/or viewed more favorably by households than those without a participatory, community-driven approach, we can explore which components of these methods might contribute to higher opinions or greater effectiveness of the projects. We first consider a measure of the intensity of community participation (the index measure described in Appendix II) and hypothesize the following:

> H_5: A greater extent or intensity of participation will contribute to larger (positive) project effects on academic outcomes and/or more favorable household opinions of the FHIS III projects.

We also explore the role or effects of specific features of participatory methods in contributing to project effects and/or household opinions of the FHIS III projects. In particular, we examine the role of parents' committees, participation in assemblies, the organization of committees for project maintenance, the respect of community preferences in project selection, and other forms

of community contributions to the FHIS III education projects that were implemented with DOCP methods.

STUDY FINDINGS AND DISCUSSION

We began our analysis by addressing the most basic research question, as articulated in hypothesis 1: Did school-aged children in households residing in communities with finished and emergency education projects have better academic outcomes than children from comparable households in communities without finished or executed projects? As described above, we compared children's school attendance and grade repetition in communities with and without finished FHIS III projects, controlling for observed differences between households in these communities, geographic location, and whether communities benefited from the PRAF. Table 3 presents the results of these generalized linear mixed models (estimated for these two academic outcomes).

The first two sets of results in Table 3 suggest that there is no effect of having a finished education project on children's grade repetition (coefficient=-0.013, p=0.635) or school attendance (coefficient=-0.084, p=0.137) in these communities, although there are other statistically significant predictors of children's education outcomes. Households with mothers with more than a primary school education were significantly less likely to have children repeating a grade ($p<0.001$), and they were significantly more likely to have all children attending school ($p<0.001$). Mechanically, the number of children in school is positively related ($p <0.001$) to all children attending school, but it is also positively associated with grade repetition ($p <0.001$) among children in the household. Households with more than two children are significantly less likely to have all of their school-aged children attending school ($p<0.001$).

Children of homeowners are less likely to be repeating a grade, while those of small business operators are more likely to repeat, possibly reflecting their contributions of labor to the business.

Not surprisingly, the third set of results in this table shows that households in communities with finished projects are significantly more likely to report having an excellent opinion of the education projects ($p < 0.001$); translating the coefficient into an odds ratio, having a finished project increases the odds of an excellent opinion by nearly 750%. Households who are small business owners are significantly more likely to report a less favorable opinion of the project.

Since finished projects include those undertaken in the early "emergency" months and those with and without participatory methods, we estimated the same set of models with variables that distinguished these three categories of finished projects to compare their separate effects relative to unfinished projects. The results presented in Table 4 do not show any substantive differences from the first set of models in the effects of the finished projects on education outcomes; that is, no statistically significant effects of these projects on education outcomes are observed. Interestingly, there is a hierarchy of effects of these different categories of projects on household opinions of the projects. Projects completed with a participatory method have the largest effect on households' (excellent) opinions of the projects.

The results of the propensity score matching analysis (see Table 5) confirm those of the probit and generalized linear mixed models, showing no effects of completed education projects on grade repetition or school attendance of children and a positive relationship of project completion to households' (excellent) opinions of the projects.[14] In fact, the estimated "average

[14] The common support in the matching models is strong; only 12 cases (1.9%) are excluded in the analysis that includes all households, and just 4 cases are dropped from the analysis that includes only completed projects.

treatment on the treated" effects produced by the matching analysis are very similar to those of the probit models: -0.013 and -0.003 (grade repetition), -0.084 and -0.081 (school attendance), and 0.476 and 0.494 (opinions). In addition, the bottom panel of Table 5 shows the results of a propensity score matching analysis that included only the subsample of households in communities with completed projects. In this analysis (including 275 completed projects), the impact of the DOCP (participatory) methodology on household opinions of the completed projects is estimated. The findings show that the participatory methodology has a statistically significant, positive impact on households' (excellent) opinions of completed education projects. In other words, the positive effect of participation on household opinions is not driven solely by whether or not the project was completed.

Table 6 presents probit models that include the index variable measuring the extent of household participation in the projects (as described in Appendix I). Once again, the results show that household participation in the projects is not significantly related to children's attendance in school or grade repetition, but it is significantly associated with household opinions of the education projects. Converting the coefficient to an odds ratio, for each additional point (higher) on the participation index, the odds of a household reporting an excellent opinion of the project are 38 percent higher. The same model was estimated using the subsample of (only) completed projects. The coefficient on the participation index variable in this model was also statistically significant and positive, indicating that for each additional point on the participation index, the odds of a household reporting an excellent opinion of the *completed* project were 26 percent higher (results available from the authors).

Finally, in Table 7 we include six measures of project/community participation (that were used in constructing the participation index and are highlighted in the table) to estimate their

separate effects on households' opinions of the education projects. Three of the variables were measured at the household level: whether the household was aware of a parent committee at the school, whether a member of the household participated in a public assembly on project financing, and if the household respondent believed that the community's preferred project was implemented. At the community level, the effects of a functioning committee for project maintenance, whether the community contributed multiple forms of support to the project, and whether the project was a *new* school on household opinions of the projects were estimated.

Three of these forms of project participation had a statistically significant, positive effect on household opinions of the projects: households' participation in a public assembly, the implementation of the community's preferred project, and having a functioning committee for project maintenance. Translated to odds ratios, households' odds of reporting an excellent opinion of the projects were 62 percent higher if they participated in a public assembly, 99 percent higher if their preferred project was implemented, and 559 percent higher if there was a functioning committee that had been organized for project maintenance. The second set of results in Table 7 shows the same model estimated for the sample of completed projects only. The direction of the effects of project participation are the same, but they are smaller and statistically insignificant, suggesting that the participation of those in completed projects (who are also more likely to have excellent opinions of the projects) is likely driving the statistically significant effects of different forms of participation in the first model (which includes households from communities without finished projects).

In general, our findings on the role of project participation support the hypothesis that finished projects using the DOCP (participatory) methodology are more favorably perceived by households in the community. Furthermore, the intensity of participation (i.e., a higher

participation score on the index measure) was also positively related to households' favorable (excellent) opinions of the project, with participation in public assemblies, project maintenance and the support of community preferences contributing significantly to positive assessments. At the same time, our study did not find (as hypothesized) that education project participation or completion was related to academic outcomes of school-aged children in the households.

CONCLUSION

Although our findings on the role and effectiveness of participatory methods in improving social investment fund outcomes are mixed, they represent an advance in our understanding of the multiple ways in which community members might engage (or not) in opportunities to contribute to development projects and the implications of their involvement for social development outcomes. The diverse approaches to research on this topic—ranging from qualitative, anthropological studies addressing the nature of participatory reforms to econometric analyses evaluating their efficacy—rarely intersect in a single study of these programs. Our study drew from both qualitative, case study information and quantitative data from an evaluation of a Social Investment Fund program specifically designed to improve and enhance participatory mechanisms and the role of community members in the planning, execution and supervision of projects in Honduras.

As the findings of this study show, concerns about the efficacy of community-driven development projects and the extent to which any benefits from them are broadly enjoyed in the community are not unfounded. No statistically significant differences in academic outcomes (grade repetition and attendance) were identified in comparisons of children attending schools in

FHIS III project communities and those in communities without finished education projects.[15] In addition, the utilization of a participatory project planning methodology was also not significantly related to children's education outcomes. These results are not inconsistent with the tepid appraisals issued within the World Bank, in which the FHIS III was rated as "moderately satisfactory," its overall sustainability as "unlikely," and in which other concerns were expressed about the program's costs and efficacy (2006).

At the same time, the use of participatory project planning (DOCP) methods in the FHIS III projects did have an impact on households' perceptions of the projects' success. Households residing in communities in which projects were implemented with DOCP methods were significantly more likely to view the results as excellent. Furthermore, our index of participation, which was designed to measure each household's level of participation in the projects, suggested that the level (or intensity) of engagement, in addition to particular types of participation, was important in contributing to favorable opinions.

One of the concerns expressed about the implementation of participatory processes, as discussed above, is that a relatively small group of privileged, well-off or better educated individuals in the community might "benevolently capture" these processes and direct them in ways that do not broadly benefit the larger community. Rao and Ibáñez (2005) reported in their study of the JSIF that better networked individuals were more likely to have their preferred projects selected. Indeed, a supplementary analysis[16] showed that Honduran households with more highly educated mothers were significantly more likely to report that their preferred project was implemented in FHIS III. However, our additional multivariate analyses also showed that

[15] Estimates of statistical power (available from the authors) did not indicate that the absence of observed impacts was due to sample sizes in this study.

[16] Results of the analysis predicting whether or not a household's preferred project was implemented and analysis of factors predicting the level of households' participation in the processes are available from the authors upon request.

more economically advantaged households did *not* have significantly higher levels of participation in the projects than poorer households. Thus, even though households with higher monthly incomes and homeowners were significantly more likely to report an excellent opinion of the project, we think it is unlikely that differences in households' opinions of the projects derive from an unequal distribution or capture of project benefits by a select group. More likely, we speculate that the significant positive association between household opinions and their level of participation in the projects might reflect (at least in part) other ways in which engagement in the FHIS projects positively impacts households, beyond the few academic outcomes that we were able to quantify in this study.

This study of the FHIS III projects also had important limitations that might account for the lack of observed statistically significant impacts of the FHIS III projects on education outcomes of youth in the project communities. First, although there were a number of education-related questions asked in the household interviews, we were only able to construct two outcome measures (of attendance and grade repetition) that were themselves limited. For example, we would have preferred to collect information from the school registrar on the number of days children of school age attended school, rather than just a household report of whether all children in the household were regularly attending school. In addition, no information was available on students' performance in school or on changes in school amenities/environments as a result of the projects that might have been expected to contribute to improved performance of children in school (e.g., teacher quality and instructional resources). Furthermore, having follow-up information over a longer period and/or at multiple follow-up time points might have allowed for the observation of effects on academic outcomes that take a longer time to mature.

Another limitation of this study (described earlier) is that the assignment of FHIS III projects to communities was not random, and in the random sample of households analyzed for this study, households in project communities appeared to be more disadvantaged than those in communities without finished projects. We used linear control functions and propensity score matching methods to adjust for observed factors that might have biased our estimation of project impacts, but we acknowledge that we had limited information to use as controls, and that other unobserved factors might still have biased our results. With a larger set of household-level baseline or pre-intervention measures, particularly measures of educational progress and performance for school-age youth, we might have been able to estimate differences-in-differences models of the change in outcomes from the pre-FHIS III to post-FHIS III period for households in communities with and without completed education projects. At a minimum, having access to this additional information would have allowed us to assess the sensitivity of our results to the assumptions we make in this analysis about the comparability of households in communities with and without finished projects.

Despite these limitations, this study makes important contributions toward improving the measurement of participation in social investment fund projects and toward our understanding of the impacts of the FHIS III in Honduras. Between 1998 and 2002, 709 new schools were constructed in Honduras through FHIS III, and many more were rehabilitated or repaired following Hurricane Mitch. As in the evaluation completed by ESA Consultores, we observed higher *average* levels of school attendance and lower *average* levels of grade repetition among school-aged children at follow-up than in 1998. However, after controlling for observed differences between households in the communities with and without projects, no statistically significant impacts of these projects on education outcomes were evident, a conclusion which is

partly at odds with the results presented in the final evaluation report produced by ESA Consultores (2005). Thus, this study points not only to the importance of careful re-analysis of information collected in impact evaluations such as this, but also to the opportunity to garner additional insights that may inform the future design and implementation of social and economic infrastructure projects in developing countries.

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Table 1: Distribution of Sample FHIS III Projects

Project Type	Project Frequency	Percent	Cumulative Frequency
Pipeline 1998	30	11.9	11.9
Hurricane-Mitch Induced Emergency	32	12.7	24.6
Water	20	7.94	32.54
Education, DOCP	10	3.97	36.51
Education, Non-DOCP	10	3.97	40.48
Roads	20	7.94	48.41
"Healthy Floors"	15	5.95	54.37
Latrines/Basic Sanitation	15	5.95	60.32
Health	20	7.94	68.25
Control-Water	25	9.92	78.17
Control-Education	30	11.9	90.08
Control-Health	25	9.92	100
Total	252	100	

Table 2: Distribution of Education Sampled Projects

Project Type	Project Frequency	Percent	Cumulative Frequency	Number of Households
Pipeline 1998	12	16.22	16.22	131
Hurricane Mitch-Induced Emergency	12	16.22	32.43	134
Education DOCP	10	13.51	45.95	110
Education	10	13.51	59.46	102
Control-Education	30	40.54	100	319
Total	74	100		796

Table 3: Impact of finished projects

Dependent Variable	**Children behind/repeating grade**			**All Children Attend School**			**Excellent Opinion of Project**		
n_1=600 households, n_2=70 projects									
Reporting marginal effects	**Estimate**	**Std error***	**z**	**Estimate**	**Std error***	**z**	**Estimate**	**Std error***	**z**
Female	0.013	0.027	0.48	0.018	0.056	0.33	0.011	0.054	0.21
Mom has more than primary education	**-0.084**	**0.022**	**-3.44**	**0.175**	**0.042**	**4.12**	-0.039	0.055	-0.70
Log of monthly income	0.001	0.011	0.07	**-0.034**	**0.017**	**-1.99**	0.022	0.028	0.79
Number of children in school	**0.065**	**0.019**	**3.31**	**0.421**	**0.053**	**7.86**	0.006	0.035	0.16
No public water source	0.014	0.030	0.48	**-0.118**	**0.050**	**-2.36**	-0.030	0.075	-0.40
Homeowner	**-0.073**	**0.035**	**-2.28**	-0.022	0.052	-0.43	-0.012	0.070	-0.17
Laborer	0.003	0.031	0.11	-0.024	0.057	-0.42	-0.004	0.054	-0.07
Operates small business	**0.094**	**0.045**	**2.48**	0.061	0.069	0.87	**-0.186**	**0.062**	**-2.88**
Number of years in neighborhood	-0.001	0.001	-1.36	0.000	0.002	-0.18	0.001	0.002	0.28
Mother heads household	-0.011	0.038	-0.29	-0.017	0.061	-0.28	0.000	0.057	0.00
More than 2 children	0.018	0.056	0.34	**-0.542**	**0.076**	**-4.50**	-0.001	0.144	0.00
Time to travel to school (in minutes)	**0.003**	**0.001**	**2.18**	**0.006**	**0.003**	**2.07**	0.001	0.003	0.37
School receives PRAF	-0.024	0.026	-0.88	0.059	0.056	1.04	-0.232	0.112	-1.85
North Coast	**0.100**	**0.036**	**3.26**	-0.042	0.054	-0.78	0.048	0.099	0.48
West Highlands	0.011	0.042	0.28	0.053	0.095	0.55	0.273	0.135	1.94
Finished or emergency project	-0.013	0.026	-0.48	-0.084	0.057	-1.49	**0.476**	**0.074**	**5.56**
Predicted probability at means	0.102			0.587			0.405		
Pseudo R-squared value	17.24%			29.89%			26.68%		

**Robust, clustered standard errors*

Table 4: Impacts of alternative FHIS III project types

Dependent Variable	**Children behind/repeating grade**			**All Children Attend School**			**Excellent Opinion of Project**		
n_1=600 households, n_2=70 projects									
Reporting marginal effects	**Estimate**	**Std error***	**z**	**Estimate**	**Std error***	**z**	**Estimate**	**Std error***	**z**
Female	0.013	0.028	0.46	0.025	0.057	0.45	0.021	0.057	0.37
Mom has more than primary education	**-0.084**	**0.022**	**-3.44**	**0.172**	**0.043**	**3.90**	-0.032	0.055	-0.58
Log of monthly income	0.001	0.011	0.07	-0.031	0.018	-1.74	0.014	0.028	0.50
Number of children in school	**0.065**	**0.019**	**3.32**	**0.427**	**0.052**	**7.98**	0.008	0.035	0.23
No public water source	0.014	0.030	0.48	**-0.124**	**0.048**	**-2.57**	-0.056	0.075	-0.74
Homeowner	**-0.074**	**0.035**	**-2.29**	-0.015	0.053	-0.29	-0.016	0.072	-0.22
Laborer	0.003	0.031	0.11	-0.030	0.058	-0.51	-0.002	0.052	-0.04
Operates small business	**0.094**	**0.045**	**2.48**	0.056	0.071	0.77	**-0.200**	**0.064**	**-2.96**
Number of years in neighborhood	-0.001	0.001	-1.36	-0.001	0.002	-0.37	0.001	0.002	0.37
Mother heads household	-0.011	0.038	-0.29	-0.021	0.064	-0.32	0.006	0.057	0.11
More than 2 children	0.018	0.057	0.33	**-0.536**	**0.078**	**-4.40**	-0.030	0.140	-0.21
Time to travel to school (in minutes)	**0.003**	**0.001**	**2.20**	**0.007**	**0.003**	**2.31**	0.001	0.003	0.40
School receives PRAF	-0.024	0.026	-0.89	0.055	0.057	0.96	-0.219	0.109	-1.83
North Coast	**0.101**	**0.036**	**3.30**	-0.052	0.053	-0.98	0.037	0.097	0.38
West Highlands	0.011	0.040	0.27	0.070	0.082	0.83	**0.286**	**0.134**	**2.03**
DOCP project	-0.014	0.041	-0.32	-0.062	0.072	-0.86	**0.587**	**0.067**	**6.11**
1998 emergency project	-0.013	0.033	-0.37	-0.006	0.088	-0.07	**0.365**	**0.099**	**3.36**
Non-DOCP project	-0.010	0.029	-0.34	**-0.211**	**0.073**	**-2.84**	**0.476**	**0.094**	**4.03**
Predicted probability at means	0.102			0.587			0.409		
Pseudo R-squared value	17.24%			30.55%			28.48%		

**Robust, clustered standard errors*

Table 5: Matching analysis of impact of FHIS III projects and participatory methods

Full sample (N=635 households)

Outcome	Sample	Finished project	No executed project	Difference	Std error	T-stat	Boostrap Std error
Child repeating a grade	Unmatched (n=635)	0.151	0.135	0.016	0.028	0.56	
	ATT (n=623)	0.150	0.153	-0.003	0.032	-0.10	0.028
All children attend school	Unmatched (n=635)	0.466	0.615	-0.149	0.039	-3.79	
	ATT (n=623)	0.472	0.553	-0.081	0.048	-1.71	0.048
Excellent opinion of project	Unmatched (n=635)	0.724	0.191	0.533	0.033	15.94	
	ATT (n=623)	0.715	0.222	0.494	0.040	12.27	0.039

Completed projects only (N=279 households)

Outcome		Project w/DOCP	Project w/o DOCP	Difference	Std error	T-stat	Boostrap Std error
Excellent opinion of project	Unmatched (n=279)	0.837	0.668	0.169	0.056	3.00	
	ATT (n=275)	0.841	0.611	0.230	0.063	3.66	0.069

Notes: The sample size for ATT reflects the number of households on the common support in the matching analysis.

Table 6: Impact of participation in FHIS III projects

Dependent Variable	**Children behind/repeating grade**			**All Children Attend School**			**Excellent Opinion of Project**		
n_1=600 households, n_2=70 projects									
Reporting marginal effects	**Estimate**	**Std error***	**p value**	**Estimate**	**Std error***	**p value**	**Estimate**	**Std error***	**p value**
Female	0.014	0.027	0.48	0.023	0.055	0.41	-0.010	0.055	-0.18
Mom has more than primary education	**-0.083**	**0.023**	**-3.27**	**0.181**	**0.042**	**4.20**	-0.094	0.050	-1.85
Log of monthly income	0.000	0.011	0.04	-0.034	0.017	-1.93	0.030	0.027	1.11
Number of children in school	0.064	0.019	3.32	**0.421**	**0.052**	**7.94**	-0.042	0.034	-1.25
No public water source	0.010	0.028	0.37	**-0.141**	**0.049**	**-2.83**	0.073	0.088	0.83
Homeowner	**-0.072**	**0.035**	**-2.20**	-0.021	0.053	-0.38	-0.072	0.073	-0.98
Laborer	0.003	0.031	0.09	-0.029	0.056	-0.51	-0.006	0.056	-0.11
Operates small business	**0.098**	**0.046**	**2.49**	0.067	0.065	1.01	**-0.166**	**0.063**	**-2.51**
Number of years in neighborhood	-0.002	0.001	-1.39	-0.001	0.002	-0.36	-0.001	0.002	-0.31
Mother heads household	-0.010	0.037	-0.27	-0.023	0.062	-0.38	0.015	0.059	0.25
More than 2 children	0.018	0.056	0.33	**-0.540**	**0.075**	**-4.60**	0.043	0.128	0.33
Time to travel to school (in minutes)	**0.003**	**0.001**	**2.17**	**0.005**	**0.003**	**2.04**	0.002	0.003	0.90
School receives PRAF	-0.023	0.028	-0.78	0.067	0.059	1.12	**-0.313**	**0.091**	**-2.90**
Participation Index	0.002	0.007	0.28	0.004	0.013	0.31	**0.073**	**0.019**	**3.78**
North Coast	**0.096**	**0.035**	**3.26**	-0.057	0.054	-1.05	0.091	0.103	0.88
West Highlands	0.008	0.042	0.20	0.033	0.101	0.32	**0.367**	**0.101**	**3.29**
Predicted probability at means	0.103			0.585			0.414		
Pseudo R-squared value	17.21%			29.57%			17.39%		

**Robust, clustered standard errors*

Table 7: Impact of participation components on opinions of FHIS III projects

Dependent Variable	**Excellent Opinion of Project**			**Excellent Opinion of Project**		
	N=563			*Only completed projects, N=237*		
Reporting marginal effects	**Estimate**	**Std error***	**p value**	**Estimate**	**Std error***	**p value**
Female	-0.056	0.057	-0.98	0.074	0.085	0.89
Mom has more than primary education	-0.053	0.055	-0.96	-0.031	0.067	-0.47
Log of monthly income	0.020	0.027	0.73	0.000	0.025	0.00
Number of children in school	-0.017	0.034	-0.49	-0.028	0.042	-0.65
No public water source	-0.090	0.090	-0.98	0.094	0.076	1.19
Homeowner	-0.095	0.072	-1.32	-0.118	0.085	-1.33
Laborer	0.011	0.053	0.20	-0.064	0.088	-0.72
Operates small business	**-0.179**	**0.059**	**-2.89**	-0.124	0.111	-1.19
Number of years in neighborhood	0.002	0.002	0.89	-0.002	0.002	-0.67
Mother heads household	0.048	0.066	0.74	0.043	0.078	0.53
More than 2 children	-0.062	0.122	-0.49	0.036	0.151	0.23
Time to travel to school (in minutes)	0.002	0.003	0.60	0.001	0.005	0.28
School receives PRAF	-0.217	0.106	-1.88	-0.257	0.174	-1.59
Parent committee at school	-0.003	0.011	-0.28	-0.005	0.016	-0.29
Participated in public assembly to secure financing	**0.108**	**0.053**	**2.03**	0.101	0.055	1.80
Community's preferred project implemented	**0.164**	**0.057**	**2.82**	0.100	0.074	1.40
Functioning committee for project maintenance	**0.392**	**0.102**	**3.57**	0.186	0.106	1.76
New school constructed	0.097	0.134	0.73	0.022	0.089	0.25
Community contributed multiple forms of support	-0.029	0.098	-0.30	-0.023	0.099	-0.24
North Coast	0.098	0.114	0.86	-0.035	0.079	-0.44
West Highlands	**0.436**	**0.107**	**3.45**	0.154	0.083	1.65
Predicted probability at means	0.398			0.753		
Pseudo R-squared value	22.64%			14.68%		

**Robust, clustered standard errors*

APPENDIX I: CREATION OF THE PARTICIPATION INDEX

There were two types of variables available to construct the participation index: those that were complete within the dataset ESA developed and those we completed using deduction. For example, one question which asked whether interviewees had participated in activities of the parents' committee was addressed only to those who replied affirmatively to whether they knew of a parents' committee at the local school. We thus assigned values of "0" for the missing observations in this variable, reflecting that parents who did not know of these committees were unlikely to have participated in their activities. The following table illustrates the distribution of the participation variables:

Table I.1: Two Categories of Participatory Variables

Available in full (796/796)		
Variable	Source	Count (of 796)
Years in the neighborhood	Interviewee	796
Knowledge of the school	Interviewee	796
Presence during project construction	Interviewee	796
Project type	FHIS	796
Expanded based on available data		
Variable	Source	Original Count (of 796)
Presence of parent's committee	Interviewee	699
Participation in parent committee activities	Interviewee	566
Participation in assembly for FHIS financing	Interviewee	727
Preference for this project or another	Interviewee	727
Offering of PRAF benefits in school	Administrator	749
Presence of a committee for maintenance of project	Administrator	645
Presence of parent's committee (administrator)	Administrator	749

In practice, with the exception of the interviewees' years in the neighborhood and project type, all positive responses to these questions were assigned a value of "1," while all responses of "no/don't know/wasn't asked" were assigned a "0." For interviewees' number of years in the neighborhood, any interviewee claiming six years or more was assigned a value of a one to record their presence in the neighborhood during the time of construction, while those with five

years or less were assigned a zero. For project type, DOCP projects were assigned a 1, while all others were coded as 0.

Some variables in the participation index (presence of a parent's committee, participation in parent committee activities, participation in the FHIS assembly to obtain funds, and presence of a committee for maintenance of project) included responses that were coded with a negative (-1) value. For example, the variable that asks if the project school has a parent's committee recorded multiple responses: yes, no, don't know, and "was not asked." To better capture the implicit dimensions of participation in this measure, we assigned: 1 if yes and correct (verified by school administrator's response); 0 if no and correct, and -1 if responded don't know or if responded yes or no and was incorrect. There is a degree of normative judgment in our decision to deduct points from the overall participation score of those interviewees who guessed and/or provided incorrect responses, but we argue that such responses may indicate these interviewees are less engaged in the community project than those who are at least aware of the opportunities to participate. At the same time, we also recognize that cultural dimensions (e.g., a preference to give some answer, even if an incorrect one), gender dynamics, and possibly even a *desire* to be involved in the project might be reflected in the incorrect guesses/responses.

The following table shows the distribution of the participation index:

Table I.2: Distribution of Participation Index Scores

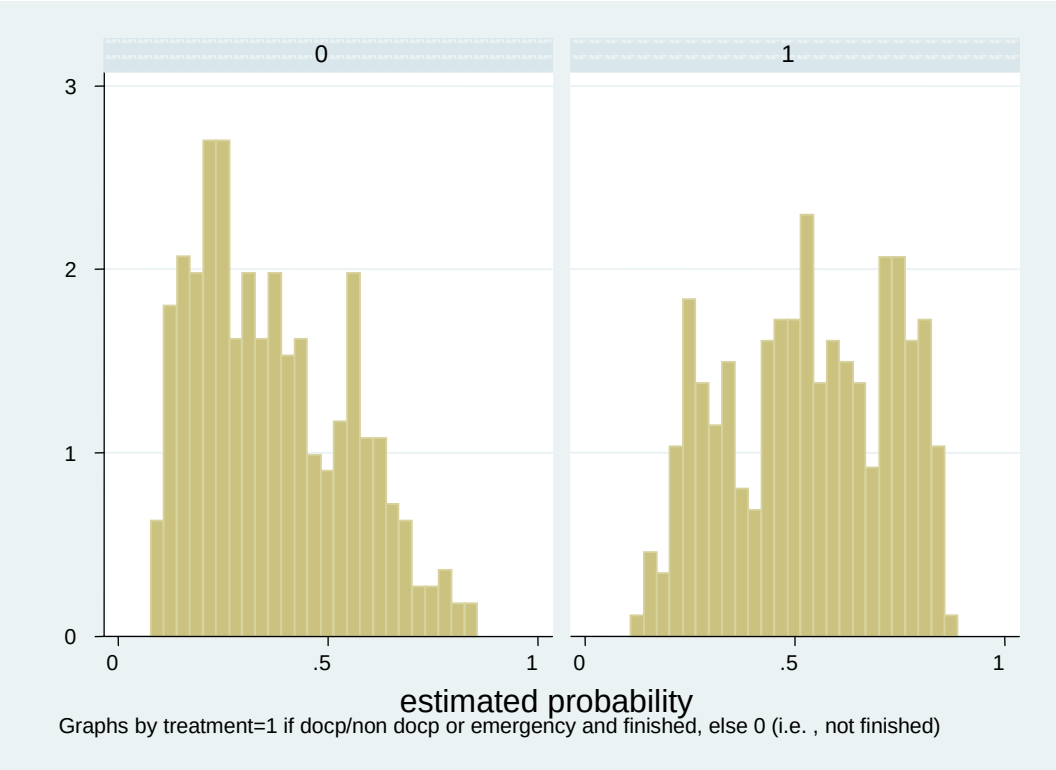
Participation Score	Frequency	Percent	Cumulative
0	4	0.5	0.5
1	18	2.26	2.76
2	27	3.39	6.16
3	76	9.55	15.7
4	94	11.81	27.51
5	138	17.34	44.85
6	148	18.59	63.44
7	128	16.08	79.52
8	109	13.69	93.22
9	34	4.27	97.49
10	17	2.14	99.62
11	3	0.38	100
Total	796		

APPENDIX II: Propensity Score Matching Analysis

Table II.1: Propensity Score Estimation

Dependent variable: Household in community w/finished project	Odds ratio	Std. error	p-value	Odds ratio	Std. error	p-value
Female	0.852	0.184	0.459			
Mom has more than primary education	0.771	0.153	0.189			
Number of children in school	0.905	0.069	0.189			
No public water source	**2.471**	**0.460**	**0.000**	**2.041**	**0.342**	**0.000**
No electricity	**2.794**	**0.583**	**0.000**	**2.944**	**0.534**	**0.000**
Homeowner	0.751	0.158	0.172			
Operates small business	0.821	0.202	0.422			
Number of years in neighborhood	1.007	0.006	0.260			
Mother heads household	1.384	0.322	0.162			
School receives PRAF	**0.532**	**0.115**	**0.004**	**0.491**	**0.098**	**0.000**
North Coast	**2.195**	**0.459**	**0.000**	**2.240**	**0.417**	**0.000**
West Highlands	**2.153**	**0.612**	**0.007**	**1.684**	**0.405**	**0.003**
Pseudo R-squared		19.49% (N=635)			16.37% (N=749)	

Figure II.1: Distribution of Propensity Scores for Treatment and Comparison Groups



Propensity score	N	Mean	Std. dev.	Min	Max
Treatment	279	.552	0.195	0.156	0.876
Comparison	356	.351	0.205	0.079	0.841

APPENDIX III: BASIC DESCRIPTIVE STATISTICS OF VARIABLES USED

Table II.1: Basic Descriptive Statistics of Variables

Variable	Mean	Standard Deviation	Number of Observations	Number Missing
1998 emergency project	0.1683417	0.3744047	796	0
Functioning committee for project maintenance	0.2914573	0.4547194	796	0
Community contributed multiple forms of support	0.2162884	0.4119883	749	47
Community's preferred project implemented	0. 531407	0. 4993264	796	0
DOCP project	0.138191	0.3453173	796	0
Female	0.6796482	0.4669051	796	0
Finished or emergency project	0.4346734	0.4960257	796	0
Homeowner	0.7047739	0.4564311	796	0
Laborer	0.4522613	0.4980287	796	0
Log of monthly income	6.181211	1.299796	745	51
Mom has more than primary education	0.3778371	0.4851706	749	47
More than 2 children	0.2072864	0.4056174	796	0
Mother heads household	0.2123116	0.4092013	796	0
New school constructed	0.1319095	0.3386052	796	0
No public water source	0.410804	0.4922891	796	0
Non-DOCP project	0.1281407	0.3344566	796	0
North Coast	0.3015075	0.4592011	796	0
Number of children in school	0.9556509	1.162712	699	97
Number of years in neighborhood	18.13317	16.14712	796	0
Time to travel to school (in minutes)	10.24697	8.931878	697	99
Operates small business	0.1934673	0.3952645	796	0
Parent committee at school	2.16166	2.755753	699	97
Participated in public assembly to secure financing	0.431912	0.4956834	727	69
Participation index	5.692211	2.057535	796	0
School receives PRAF	0.2550067	0.4361562	749	47
West Highlands	0.1457286	0.3530558	796	0