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Local Inequality and Project Choice:

Theory and Evidence from Ecuador

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Abstract: This paper provides evidence consistent with elite capture of Social Fund investment projects in Ecuador. Exploiting a unique combination of data-sets on village-level income distributions, Social Fund project administration, and province-level electoral results, we test a simple model of project choice when local political power is unequally distributed. In accordance with the predictions of the model, poorer villages are more likely to receive projects that provide excludable (private) goods to the poor, such as latrines. Controlling for poverty, more unequal communities are *less* likely to receive such projects. Consistent with the hypothesis of elite capture, these results are sensitive to the specific measure of inequality used in the empirical analysis, and are strongest for expenditure shares at the top of the distribution.

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1. Introduction

Should resource allocation decisions of anti-poverty programs be taken at the local level, or should they remain centralized? Two recent trends combine to underscore the relevance of this question. First, a growing number of developing countries have made poverty reduction an explicit development objective, and many have made real policy efforts towards that objective. Second, decentralization of spending authority to local governments has become common practice in a number of countries. In addition, a whole new breed of anti-poverty programs in developing countries are introduced from the outset as highly-decentralized, demand-driven initiatives, where decisions on the type of expenditures and investments are meant to be made by the local beneficiaries themselves, in a participatory manner.[2]

Yet, the theoretical literature remains ambiguous in its assessment of the rationale for decentralization. The ambiguity arises from the trade-off between the local government's advantage in terms of access to superior information at lower cost, and the possibility that the risk of capture of decision-making by special interest groups is higher at the local level than at the national level. This possibility is the so-called "Madisonian presumption" that "the lower the level of government, the greater is the extent of capture by vested interests, and the less protected minorities and the poor tend to be." (Bardhan and Mookherjee, 2000, p.135)[3]

Theoretical models have identified a number of factors that may lead to greater capture at the local level (such as greater levels of voter ignorance, or the greater cohesiveness of local interest groups), and others that may lead to greater capture at the center (such as higher costs for detecting and punishing bureaucratic corruption at the central level). The unavoidable conclusion has been that: "the contrasting roles of these diverse factors suggest that the extent of relative capture at the local level may well turn out to be context- and system-specific. This creates the need for empirical research to

[2] These so-called Community Driven Development (CDD) programs have become a major form of development assistance. For an excellent review of the community-based and community-driven development programs, see Mansuri and Rao, 2004. They note that the World Bank alone lent $2 billion dollars to CDDs in 2003.

[3] In addition to the contributions by Bardhan and Mookherjee (2000, 2005), see also Dasgupta and Kanbur (2001) and Platteau (2004).

identify the nature of relative capture in any given setting, in order to appraise the potential pitfalls of decentralization." (Bardhan and Mookherjee, 2000, p.139).

Quantitative empirical evidence of elite capture of specific decentralized programs certainly exists, but it is not particularly abundant. Galasso and Ravallion (2005) find that the targeting performance of the Food for Education program in Bangladesh is worse in communities where land inequality is greater, and argue that this reflects greater capture of the benefits by the elite when the poor are less powerful. Examining India, Rosenzweig and Foster (2003) show that increases in the population weight of the poor result in increases in the likelihood of receiving pro-poor projects (such as roads) in villages with elected *panchayats*, but not in villages with more traditional leadership structures, suggesting that local democracy matters for whether or not decentralization benefits the poor.

There are two principal reasons why empirical studies of elite capture of decentralized programs remain rare. The first reason is that income, consumption or wealth data that are representative at the level of disaggregation required for studying program incidence within villages are extremely rare. Most household surveys are not representative at that level. The second reason is that a key mechanism for capture is influence over the *type* of expenditure to be financed from available resources – and this raises the difficult question of defining what types of projects benefit the poor more than others.

In this paper, we use a unique combination of data-sets from Ecuador to investigate whether there is any evidence consistent with elite capture in the pattern of project choice by communities that were awarded Social Investment Fund grants. Our data include reliable poverty and inequality estimates at the community level, obtained by combining high-quality information from a household survey with Census data. They also include administrative data on project approvals and expenditures by type and by community, for a period of almost three years. Finally, to account for relative capture vis-à-vis the central government, we also use province-level data on the results of the presidential election that predate the period under consideration.

Identifying elite capture in the context of Social Funds has proved hard because the Funds typically provide beneficiary communities with a menu of projects to choose

from, most of which provide public goods, and all of which are intended to benefit the poor. In this paper, we exploit the fact that the menu offered by the Ecuadorian Social Fund – which we describe in more detail in the next section – included basically two types of projects: local public goods (whose valuation may vary across individuals, but which are accessible to all) and excludable (private) goods. By far the most important private goods (in project numbers) provided were latrines, which were built in land plots belonging to community members with no previous access to toilet facilities. These individuals tended to be highly concentrated among the poorest, and were almost never among the richest members of the community, who might be identified with the elite.

We propose a simple model of project choice between public and private goods, under the assumption that political power is positively correlated with socio-economic status (proxied by per capita household expenditures). The model predicts that, controlling for inequality, poorer communities would select latrine projects (the excludable projects mostly needed by the poor) more often than better-off ones. It also predicts that, controlling for poverty, more unequal communities would choose latrine projects less often, as a result of a concentration of power in the hands of richer people, who do not need new latrines. To the extent that such a choice reflects differences in power, rather than need, it constitutes capture of the program.

Econometric analysis of project choice between 1993 and 1996 reveals a pattern that is consistent with the predictions of our model. Controlling for poverty, various measures of access to services, and a number of geographic and demographic variables, communities with *greater* inequality chose pro-poor excludable (latrine) projects significantly *less* often. Consistent both with the notion of "elite capture" and with the fact that complete access to toilet facilities is only observed at the top of the income distribution, these results are strongest for inequality measured as the expenditure share of the top 1%, 3% or 5% of households. This effect becomes smaller and less significant as our definition of the elite is expanded and completely disappears if the expenditure share of the rich is replaced by the Gini index. The results are also remarkably similar under two different econometric specifications.

The paper is organized as follows. In the next section, we briefly review the literature on Social Funds, and describe Ecuador's Fondo de Inversión Social de

Emergencia (FISE). The nature of this Social Fund informs the structure of our model of project choice, which is presented in Section 3. Section 4 describes the data sets used in the analysis, with emphasis on the administrative FISE project monitoring and information data, and on the community-level estimates of poverty and inequality. Section 5 presents our empirical results, and section 6 concludes.

2. Social Funds and Ecuador's FISE

Social funds are (usually administratively autonomous) agencies that finance small sub-projects in several sectors - such as education, health, water, and sanitation - in response to demands articulated by local groups and screened against a set of eligibility criteria. They were set up in many countries in the 1980s and 1990s, initially as temporary measures to mitigate the social costs of structural adjustment programs but, with time, many have acquired a more permanent character. They operate as second-tier agencies that appraise, finance, and supervise implementation of social investments identified and executed by a wide range of actors, including local governments, NGOs, local offices of line ministries and community groups (White, 2002). Funds channeled through these agencies are not insubstantial.[4]

In addition to accounting for increasingly large development flows, a number of studies suggest that most Social Fund projects are (mildly) pro-poor, and that they deliver projects to rural (and nowadays urban) areas which lack basic infrastructure.[5] Beneficiary assessments often indicate that the projects are a top priority for the community.[6] Social Funds have also drawn praise for their lean and efficient operation, which usually stands in stark contrast to the performance of line ministries in many developing and middle-income countries.

[4] Over the last decade, the World Bank alone has financed close to $5 billion through Social Funds, in over 120 projects in almost 60 countries (van Domelen, 2002).

[5] The literature evaluating Social Funds has grown rapidly in recent years. Important contributions include Chase (2002) on Armenia; Chase and Sherbourne Benz (2001) on Zambia; Newman et al. (2002) on Bolivia; Paxson and Schady (2002) and Schady (2000) on Peru; Pradhan and Rawlings (2002) on Nicaragua; and Rao and Ibáñez (2005) on Jamaica. World Bank (2003) provides a multi-country analysis.

[6] Although, Platteau and Gaspart (2003) argue that villagers may not express their reservations about the financed project or the role of the elite, for fear of losing the funds. For the poor (or the non-elite), any public investment in the community might be better than nothing, even if it is not what they would have ideally wanted.

A defining principal of most – if not all – Social Funds is their decentralized and participatory decision-making process. At the central level, the agency administering the Fund typically designs a menu of projects which communities can apply for. This menu is then presented to selected communities, which are expected to choose one or more projects in some (typically ill-defined) participatory manner.[7] The process by which the decision is reached is neither pre-determined, nor usually very well-documented. Nevertheless, a number of qualitative studies have suggested that the process of project choice at the village level is not devoid of politics, and does generally reflect differences in local power and influence.

Often, an NGO, a local government agency, or a "prime mover", such as a village headman or a school teacher, acts as an intermediary between the community and the Social Fund. De Haan, Holland, and Kanji (2002) suggest that these people or organizations are not mere intermediaries. In many instances, these prime movers decide what project will be chosen before any community meeting ever takes place and subsequently inform the community of their choice (and often on how the villagers can contribute). Such local political processes can affect the incidence of Social Fund expenditures within the targeted communities, and thus impinge upon their effectiveness to reduce poverty. For example, White (2002) points out that since the 'prime mover' is very often a headmaster/teacher (or a health worker) there is a disproportionate number of schools (or clinics) amongst Social Funds projects.[8]

Ecuador's Social Fund, FISE, was created in March 1993 with the aim of compensating the poor for reductions in overall public spending that had been implemented as part of a macroeconomic adjustment program intended to lower inflation. FISE was created with resources from international organizations (U.S. Agency for International Development, Inter-American Development Bank, the Andean Finance Corporation, and the World Bank) matched by local funds. It was administered by a national agency under the direct supervision of the President, and had a board of

[7] Communities are typically selected to receive a visit from the Social Fund on the basis of some poverty ranking, with the poorest communities being targeted first.

[8] From this last perspective, the presence of some kind of local "elite" might be needed for an application to actually become formulated. Bardhan & Mukherjee (2000), Khwaja (2002), and Dayton-Johnson & Bardhan (2002) suggest the possibility of a non-linear effect of income inequality: while some differentiation across community members might be helpful, too much inequality may hamper cooperation.

managers with representatives of various ministries, including Social Welfare, Education, Health, Labor, Finance, Agriculture, and Information.

FISE financed small projects that were managed and implemented by local governments and civil society organizations. The resources could be used for five project categories: social infrastructure (including construction of schools, health clinics, day care centers, latrines, and equipment for such facilities), socio-economic infrastructure (including water supply, sewerage, road rehabilitation, and irrigation), social services (including health, nutrition, and hygiene interventions, teacher training, etc.) institutional development (providing support to community operations and maintenance committees), and productive community investments (financing for group activities in agriculture, livestock, fishing, etc.).[9] However, they could not finance the operational budgets of implementing organizations. Appendix Figure 1 shows the location of all FISE projects disbursed between May 1993 and January 1996 – which constitutes our project-level data set – on a map of Ecuador. Each subdivision in the map corresponds to one canton (or *district*), and the three shaded areas denote the main geographic regions of the country: the Coast, the Sierra, and the Oriente (Eastern Region). Cantons in which p*arroquias* received latrine projects are shaded black, and in which *parroquias* received other projects (but no latrines) are dotted.

Before approaching the communities, FISE established central targets for the share of the budget that should be spent on different types of projects (at the aggregate level).[10] In addition, it adopted geographic targeting criteria, by allocating proportionally more resources to communities with higher numbers of poor individuals. These geographical poverty targets were established for aggregate resource transfers, and did not specify project *types* for each individual locality. For the selection of project type, FISE employed a participatory, demand-driven approach. Regional offices organized meetings with community organizations and local government representatives to promote the program and to explain the guidelines for project application. In these sessions, FISE officials described the different types of projects for which resources were available, provided reference costs for each type, and explained the process through which

[9] See World Bank, 1994 for more detail on the sub-project categories.
[10] The term community is henceforth used as a synonym of – and interchangeably with – *parroquia* ("parish"), the smallest administrative unit in Ecuador.

communities could apply for funds to implement one or more projects. Unfortunately, there are no records of what the specific processes of project selection were at the community level.

Once FISE approved a project, an executing agency or contractor was chosen and a representative from the community was appointed to ensure that the contract was honored during project execution.[11] The projects that FISE financed represented a transfer of resources to local communities that were generally very poor, at no fiscal cost to the recipients. Since communities did not have the administrative resources to apply for projects in all possible categories (and since this would in any case have been discouraged by FISE representatives), it stands to reason that the decision of what type of project to apply for would be taken seriously by community members. In the next section, we propose a simple "pivotal voter" model of project choice for a social fund such as Ecuador's FISE.

3. A Simple Model

This section presents a simple model of project choice in communities where there is wealth inequality, and where local power is related to wealth. We consider a situation in which communities can choose between a public good project and a private good project, and where the private good is a basic necessity.[12]

Consider an economy, the rural sector of which consists of J communities (or villages), indexed by $j = 1,\ldots, J$. Agents who live in these communities are indexed by $i \mid i \in j = 1,\ldots,I_j$. Agents are ex-ante identical in every respect, except for their initial wealth level, w_i. Each village is therefore characterized by its own wealth distribution function, $F_j(w)$.

There are three goods in this economy. The first is a perfectly divisible private consumption good c, which is taken as the numeraire. We think of this composite good as including the basic necessities of life in a developing country, such as food and clothing.

[11] This community representative was granted a power of attorney by the community for whom he was acting as an agent.

[12] This approach is appropriate for modeling Social Funds, because these agencies typically offer communities project *menus*, which mostly consist of local public goods projects (like schools and health clinics), and some private goods projects for what are considered basic necessities - such as latrines.

The second good, *x*, is a lumpy private good. It is consumed in discrete units, at price *p>1*. We think of it as an excludable good that may require considerable investment to purchase or produce, such as a latrine, a house, a roof or a refrigerator. Finally, there is a (local) public good *g*, such as a village school, a health clinic, or a road. Even if *g* is technically excludable and rivalrous in consumption (such as a classroom), we assume local institutions are such that the good is treated as a local public good.

Agents are endowed with initial wealth level w_i, and with a unit of labor ($l_i = 1$), which they supply inelastically. This is a simple rural economy, in which all production (of the numeraire good *c*) takes place through a common-knowledge production function:

$$y_i = f(l_i, w_i),\ f_l,\ f_w > 0,\ f_{ww} < 0 \qquad (1)$$

The production function is assumed to be atomistic: no production pooling is possible across agents. We also assume an extreme form of credit market failure: no credit markets exist at all. For simplicity, we assume that *x* and *g* are produced in a separate sector of the economy (possibly the "urban" sector) and traded, but the results would carry through if *x* were produced using an individual's own labor and wealth, provided its lumpy character were preserved. The rural sector is a small player in the market for *x*, so its price is taken as given. Because of its local public good nature, we assume that *g* can only be produced by the government, and some amount g_j is exogenously provided to village *j* prior to the launch of the Social Fund.

Agents maximize an objective function given by:

$$U(c_i, x_i, g_j) \qquad (2)$$

subject to $c_i + px_i \leq y_i$.

The utility function in (2) is weakly increasing and concave in all arguments, and is additively separable, so that $U_{cx} = U_{cg} = U_{xg} = 0, \forall c, x, g$. It satisfies the Inada conditions on all three goods but, with respect to good x, it also satisfies:

$$U_x(c,0,g) \geq p \text{ (from the Inada condition) and } U_x(c,1,g) = 0. \qquad (3)$$

The conditions in (3) imply that there is a unit individual demand for *x*. An individual who does not own a unit of *x* wants to purchase it, but any additional unit after

the first one has no value. We argue that, in a poor rural setting, this is broadly consistent with its chosen depiction of a house, latrine or refrigerator.

Pre-Social Fund Equilibrium

Under these assumptions, an equilibrium of this rural economy is fully described by its income distribution and consumption profile. Let $G_j(y)$ denote the unique income distribution function in village *j*, which is deterministically derived from the application of individual endowments (labor and wealth) to production function (1).

The consumption profile is as follows:

$$c_i = y_i \quad ; \quad x_i = 0 \text{ and } g_{ij} = g_j \qquad \text{if } y_i < \tilde{y} \qquad (4)$$

$$c_i = y_i - p \; ; \; x_i = 1 \text{ and } g_{ij} = g_j \qquad \text{if } y_i \geq \tilde{y}$$

where $\tilde{y} = \inf\{y | x(p, y) = 1\}$ denotes the lowest level of income at which agents start demanding one unit of good *x*. Without making additional assumptions about the utility function, we do not know the exact value of $\tilde{y}$, but we do know that $0 < p \leq \tilde{y} < \infty$, for any utility function satisfying the properties of (2) – in particular the Inada conditions and (3).

The implication is that the poorest section of the population – a proportion $G_j(\tilde{y})$ in village j – does not consume good *x* (the latrine, or refrigerator).[13] *x* is only consumed by people richer than $\tilde{y}$. Everyone in village j has access to the exogenously given level of local public good g_j.

The Social Fund and the Politics of Project Choice

Now suppose that a social fund is created with the explicit objective of reducing deprivation in this rural economy, by making in-kind transfers of goods *x* and *g* (which are produced elsewhere) to specific communities. In keeping with the participatory

[13] In our empirical analysis, we use latrines to stand for good *x*. Table 1 shows that, in our data, it is primarily poor people who have no toilet facilities. The richer a household is, the higher is its likelihood of having access to private toilet facilities of some kind. Other evaluations of Social Funds from Latin America show that latrine projects are the most progressive option on the menu of many Social Funds (see, e.g., Pradhan and Rawlings, 2002).

design of Ecuador's FISE, suppose the communities themselves must decide what project they prefer to receive.

Specifically, suppose each community *j* must choose one of two possible projects:

$\pi_1 : \forall i \in j$, *i* receives one unit of *x;* or

π_2 : *j* receives an increment of public good of Δg_j .

Social preferences over these two project options depend on how large Δg_j is, and it is useful to distinguish two cases[14]:

Case (I): $U(c,1,g_j) - U(c,0,g_j) \leq U(c,0,g_j + \Delta g_j) - U(c,0,g_j), \forall c, g$ (5)

Case (II): $U(c,1,g_j) - U(c,0,g_j) > U(c,0,g_j + \Delta g_j) - U(c,0,g_j), \forall c, g$

Given individual preferences and the resulting pre-Social Fund consumption profile described by (4), it can be shown that, in both cases, the preference profile in each community satisfies the single-crossing condition of Gans and Smart (1996), which is sufficient for the existence of a majority voting equilibrium.[15]

Proposition 1. In both cases I and II, the preference profile over the project set $\Pi = \{\pi_1, \pi_2\}$ *satisfies the single-crossing condition.*

Proof: see Appendix.

Proposition 1 ensures the existence of a majority voting equilibrium over project types in these villages. But how should we model the political process of project choice in the context of a social fund? Although "community participation" and "decentralized decision-making" were buzzwords frequently found in the documents that launched FISE in Ecuador in 1993 – and indeed in most other Social Funds – it is harder to find a description of the exact decision-making procedures that communities were supposed to

[14] Additive separability of the utility function allows us to define Cases I and II for any level of *c*, g_j.

[15] Since the relevant social choice is over a discrete set $\Pi = \{\pi_1, \pi_2\}$, it is convenient to use Rothstein's (1990) order restriction as a sufficient condition for the existence of majority rule. In the proof of Proposition 1, we appeal to the fact that preferences that satisfy order restriction must also satisfy single-crossing, as shown by Gans and Smart (1996). This approach is more appropriate for the discrete voting problem we consider than relying on the monotonicity (in incomes) of marginal rates of substitution between x and g, or any of the alternative characterizations of single-crossing proposed by Gans and Smart (1996).

follow in applying for a project. Local NGOs were often involved, and village or town assemblies are known to have taken place. In all cases, a full proposal had to be written and submitted to a *Comite de Aprobaciones* (Selection Committee). It is not clear whether an explicit vote was taken on a number of proposals within each village, or what alternative mechanism existed to make these choices.

Bearing this in mind, we model the political process at the community level in a reduced-form manner that allows us to rely on the existence of the majority voting equilibrium (from Proposition 1), but which also allows for the existence of inequalities in political power among community members. Let each agent *i* be endowed with influence over village affairs that is given by an *influence function* $v\left(\frac{y_{ij}}{\mu_j}\right)+\varepsilon_{ij}$. y_{ij} is the individual's own income and μ_j denotes the mean income in the village. ε_{ij} is a zero-mean random variable, distributed according to $H(\varepsilon)$ in $\left[\underline{\varepsilon},\bar{\varepsilon}\right]$, independently from income, which is meant to capture idiosyncratic determinants of influence, such as personality.

Only three conditions are imposed on influence functions:

(i) $v\left(\frac{y_{ij}}{\mu_j}\right)+\varepsilon_{ij}\geq 0,\forall i,j$;

(ii) $v'\left(\frac{y_{ij}}{\mu_j}\right)\geq 0,\forall i,j$; and

(iii) $\int_0^{\infty}\left[\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left[v\left(\frac{y_{ij}}{\mu_j}\right)+\varepsilon_{ij}\right]dH(\varepsilon)\right]dG_j(y)=1.$

The influence function simply postulates a link between relative income levels and political power. Since influence over village affairs is an internal village matter, it is natural to think that it depends on relative, rather than absolute income levels: if everyone's incomes double, relative political power remains unchanged. Condition (i) imposes that there is no such thing as negative influence. Condition (ii) assumes that the relationship with relative incomes is non-decreasing throughout (though idiosyncratic factors are allowed through the term ε_{ij}). Condition (iii) normalizes influence so that it sums to one over the entire community. Under these three conditions, majority rule is modified only in that the decisive voter is no longer the *median* voter, but the expected

pivotal voter $p^* = G(y^*)$, where y* is implicitly determined by $\int_0^{y^*}\left[\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left[v\left(\frac{y_{ij}}{\mu_j}\right)+\varepsilon_i\right]dH(\varepsilon)\right]dG_j(y)=\frac{1}{2}$.[16]

Project selection and the local distributions of income and influence

Given the political process outlined above, village decisions on whether to apply for project π_1 or π_2 hinge on which case of Equation (5) applies, and then on whether or not $y^* \geq \tilde{y}$. As shown in the proof to Proposition 1, under Case I, project π_2 is chosen unanimously. It is natural to interpret Case I as one in which village need for public good g_j is very high. Perhaps there is no school at all, or no roads through which to transport produce to nearby markets. If need for g_j is so great that even those without latrines (or refrigerators) prefer an increment in the level of the local public good than to get access to a unit of *x*, then there is unanimous support for the local public good project.

Under Case II, the utility gain (to those individuals who do not yet own a unit of *x)* from project π_1 - which provides an additional unit of good *x* to each individual – is greater than the gain from project π_2 - which provides a given increment in the supply of the local public good, Δg_j.[17] But we know from the pre-social fund equilibrium that this is the case only for those individuals with $y_i < \tilde{y}$. Those with incomes $y_i \geq \tilde{y}$ already own a unit of *x*, and always prefer π_2. Project preferences therefore differ on 'class' lines, with the poorest agents in *j* supporting project π_1, and the richest agents supporting π_2. In this case, since the expected pivotal voter is at percentile $p^* = G(y^*)$, the decision hinges on the relationship between the economic threshold $\tilde{y}$ and the political threshold, y*. If $y^* \geq \tilde{y}$, π_2 is chosen. π_1 is chosen otherwise.

[16] See Bénabou (2000) and Ferreira (2001) for earlier applications of the pivotal voter model, and its consistency with modified "median-voter type" results when preferences satisfy the single-crossing condition. This framework provides a simple alternative to the probabilistic voting model used, e.g., by Bardhan and Mookherjee (2005), which is better suited to modeling the election of a local government than to the selection of project types.

[17] Case II corresponds to situations in which the endowment of the local public good g_j is not so low, and those without lumpy private goods (e.g. latrines) gain a greater welfare improvement from a unit of the latter than from the proposed expansion in schools, health clinics or roads.

Since Case II is the one in which there is no consensus, it is clearly the one of interest for a study of the politics of project choice. If we restrict attention to this case, and define a poverty line of $\tilde{y}$, it is possible to make two specific and testable predictions about the relationship between village poverty and inequality levels on the one hand, and project choice on the other. [18]

Proposition 2: In case (II) of equation (5), for a given influence function and for a given village Lorenz curve, a greater incidence of poverty leads to a greater probability that project π_1 is chosen.

Proof: see Appendix.

Proposition 3: In case (II) of equation (5), for a given influence function and controlling for poverty incidence, an increase in inequality due to regressive income transfers from poor to non-poor agents reduces the probability that project π_1 is chosen.

Proof: see Appendix.

The intuition for these results is straight-forward. Proposition 2 states that, since people with incomes lower than the threshold level $\tilde{y}$ prefer project π_1 (e.g. latrines), the probability that this project type is selected, everything else constant, rises in $G(\tilde{y})$, which is the poverty incidence. An increase in the population mass below $\tilde{y}$, keeping relative incomes (i.e. the Lorenz curve) and the influence function $v(y/\mu)$ constant, causes cumulative political power to reach the 50% threshold at a lower income level than before. Appendix Figure 2 illustrates such a movement from density function $g_0(y)$ to $g_1(y)$. In this case, since the new pivotal voter is at income level $y^*_1 < \tilde{y}$, project π_1 is now chosen instead of π_2.

[18] In this economy, it seems natural to treat $\tilde{y}$ as the poverty line. Economists from Adam Smith to Amartya Sen have defended a view of poverty as the inability to consume goods (or enjoy functionings) widely regarded as basic necessities in their community. In this model, $\tilde{y}$ is exactly such a threshold. In what follows, we treat it as the poverty line, although qualitatively similar results would hold for any poverty line $z \leq \tilde{y}$.

A similar logic accounts for the result in Proposition 3. For a given population mass below $\tilde{y}$, an income transfer from those below that threshold to those above it increases income inequality but also transfers political power from the poor to the non-poor. Since the poor prefer π_1 and the non-poor prefer π_2, this transfer of political power – in expectation, or, alternatively, for a given $H(\varepsilon)$) – shifts the political equilibrium from a choice of project π_1 to a choice of project π_2. Appendix Figure 3 illustrates such a shift from density function $g_0(y)$ to $g_1(y)$, which raises the income level of the expected pivotal voter from y^*_0 to y^*_1.

Proposition 2 leads to the testable prediction that, controlling for local inequality, villages with a greater incidence of poverty should receive *x*-good (latrine) projects *more* often than those where poverty is lower. Proposition 3 suggests that, controlling for the incidence of poverty, villages with higher inequality levels should receive *x*-good projects *less* often.

Qualifying Remarks

Before we take these predictions to the data, three final observations about the model are in order. First, Proposition 2 was stated and proved for a poverty line that coincides with the income threshold below which pre-social fund consumption of the *x*-good was zero ($z = \tilde{y}$). We argued that it made intuitive sense to choose that threshold as a poverty line, but the result in Proposition 2 would carry through for the case $z \leq \tilde{y}$, provided the increase in $G(z)$ came at the expense of density mass above $\tilde{y}$. Such an increase in the incidence of poverty would still result in an increase in political support for π_1, as before.

Second, it should be noted that not all increases in inequality are predicted to reduce the probability that project π_1 is chosen. Only increases in inequality resulting from regressive transfers across $\tilde{y}$ would have that effect, since they increase the power of π_2 supporters, at the expense of π_1 supporters. This suggests that we may not expect all measures of inequality to conform to the prediction of the model. If $\tilde{y}$ is a fairly high income level – which is plausible given the numbers of people with no access to toilet facilities in the data (see Table 1) – then a generic measure of inequality, such as the Gini

coefficient, may not be suitable to test this proposition. In that case, only transfers of income from the "poor" to the very rich would be predicted to reduce the probability of *x*-good projects.

Finally, in many social funds, including Ecuador's FISE, communities were permitted to apply for more than one project. In our framework, this corresponds to adding a third project type:

$\pi_3 : \forall i \in j$ receives one unit of *x* ***and*** j receives an increment of public good of Δg_j.

With these three projects, and given the pre-Social Fund consumption profile in (4), it is clear that $\pi_3 P_i \pi_1 P_i \pi_2$ for i: $y_i < \tilde{y}$, and $\pi_3 I_i \pi_2 P_i \pi_1$ for i: $y_i \geq \tilde{y}$, where P (I) denotes the strict preference (indifference) of individual i (as in the proof of Proposition 1). It is easy to check that Rothstein's order restriction condition is still satisfied in all pairwise comparisons across all elements in $\Pi = \{\pi_1, \pi_2, \pi_3\}$. The key consideration for our results is the indifference of non-poor voters ($y_i \geq \tilde{y}$) between π_2 *and* π_3. If the pivotal voter were non-poor, it would be enough to introduce any infinitesimal additional cost – such as a greater supervision cost – to him or her of choosing π_3 over π_2, to induce him to choose π_2. In that case, both a greater incidence of poverty and progressive transfers across $\tilde{y}$ would be associated with observing π_3 : multiple projects that include *x*-good (latrine) projects. Lower poverty and greater inequality (due to regressive transfers across $\tilde{y}$) would lead us to observe public good projects π_2, but no latrine projects.

We are now in a position to take the predictions of this simple model to the data, which refers to Ecuador's Social Fund in the period from 1993 to 1996. The next section describes our data sets, and the empirical results are discussed in Section 5.

4. The Data Sets.

Project-Level Data

The Ecuador FISE project included the introduction of a computer-based management and information system (MIS) that was intended to assist with monitoring of the project cycle and the overall performance of the project. The MIS provides

information on the type, number and location of projects; key dates (of application, approval and completion); size of FISE transfer; amount of community-level counterpart funding (if any); and the name of implementing agency (contractor, NGO, the community itself, etc.).[19] MIS data covering all projects that were applied for between May 1993 and January 1996 - and that were granted - serve as our source of project-level information. Information is available on a total of 2,876 projects. As foreshadowed in the previous section, the MIS data reveal that many *parroquias* applied for and were granted more than one FISE project. An important limitation of the data set is that MIS did not keep records of unsuccessful applications.

For the purposes of this study, the key variables of interest are the type of project chosen by each community, and the name and location of the beneficiary community. Table 2 documents the percentage breakdown of projects across types. Just over a third of projects (34%) comprise the acquisition of school equipment and materials.[20] Another 32% of projects involved new construction of school rooms or school buildings. While projects supplying school equipment involved the delivery of goods in kind, construction projects involved transfers of funds which were used to finance contractors for the construction work.

A third, sizeable, category of projects comprises construction of latrines (13% of all projects). These projects are of central importance to the analysis in this paper, since they embody the two main properties of the *x*-good projects (π_1) discussed in Section 3. First, latrines are used largely by the poor in rural Ecuador (see Table 1). Evidence from household surveys indicates that non-poor households are far more likely to use other forms of sanitation infrastructure – such as toilets with connections to a networked water supply, or septic tanks. Second, the latrines constructed by the FISE were intended as private goods delivered to households with no previous sanitation infrastructure. Project documents indicate that beneficiary households obtaining such latrines had to provide the

[19] Unfortunately, the project funding data seems to be unreliable for use in our empirical analysis. For example, for projects with in-kind transfers, such as equipment and materials, the funding is usually entered as 'zero' in the MIS database. Furthermore, sometimes the total amount of funding the community or the applicant received seems to have been entered under one project line and the rest of the projects again register 'zeros'. For this reason, we refrain from using MIS funding amounts data in our analysis.

[20] FISE project documents indicate that equipment included such items as blackboards and desks, but the school equipment and materials projects explicitly did not allow for the acquisition of school books.

land on which the latrine was constructed. Each beneficiary household received a latrine, and these were intended for the household's exclusive use.[21]

The empirical analysis below takes as unit of observation all *parroquias* in rural Ecuador. Our main variable of interest takes on three different values depending on whether a *parroquia* received *no project*, *at least* one latrine project, or at least one FISE project but no latrine projects. We seek to assess to what extent the value taken by this indicator variable is affected by community-level characteristics, such as poverty and inequality.

Poverty and Inequality Estimates at the Community Level

Poverty and inequality rates were estimated at the level of each *parroquia* on the basis of a methodology that is described in detail in Elbers, Lanjouw and Lanjouw (2002, 2003). We estimate poverty based on a household per-capita measure of consumption expenditure, y_i. A model of y_i is estimated using 1994 household survey data (INEC's *Encuesta Sobre Las Condiciones de Vida - ECV*), with the set of explanatory variables restricted to those that are also found in, and strictly comparable to, the population census of 1990. We regress log per-capita consumption expenditure for household *i* on a set of household-level demographic, occupational and educational variables, as well as census variables calculated at the level of the census-tract or other level of aggregation above the household level:

$$\ln y_i = \mathbf{x}_i\boldsymbol{\beta} + u_i, \qquad (6)$$

where $\boldsymbol{\beta}$ is a vector of k parameters and u_i is a disturbance term satisfying $E[u_i|x_i] = 0$. The model in (6) is estimated using the survey data. We then use these estimates to calculate the welfare of an area or group in the population census. Letting W represent an indicator of poverty or inequality, we estimate the expected level of W given the observable characteristics in the population census, and the parameter estimates from (6). We denote this expectation as:

[21] A separate category of FISE projects – designated "public toilets" – are more readily seen as public goods, and are kept separate from the latrines category in Table 1. These represent around 4% of all FISE projects.

$$\mu_j = E[W \mid \boldsymbol{X}_j, \boldsymbol{\xi}], \quad (7)$$

where $\boldsymbol{X}_j$ is a matrix of observable characteristics in community j and $\boldsymbol{\xi}$ is the vector of model parameters, including those that describe the distribution of the disturbances.

In constructing an estimator of μ_j we replace the unknown vector $\boldsymbol{\xi}$ with consistent estimators, $\hat{\boldsymbol{\xi}}$, from the survey-based consumption regression. This yields $\hat{\mu}_j$. This expectation is generally analytically intractable so we use simulation to obtain our estimator, $\tilde{\mu}_j$.

The first-stage estimation is carried out using the ECV 1994 household survey, which is stratified at the regional level, as well as for rural and urban areas. Within each region there are further levels of stratification, and also clustering. At the final level, a small number of households (a cluster) are randomly selected from a census enumeration area.

Our empirical model of household consumption allows for an intra-cluster correlation in the disturbances (see Elbers, Lanjouw and Lanjouw, 2002, 2003 for more details). Failing to take account of spatial correlation in the disturbances would result in underestimated standard errors. We estimate different models for each region and we include in our specification census mean variables and other aggregate level variables in order to capture latent cluster-level effects. All regressions are estimated with household weights. We also model heteroskedasticity in the household-specific part of the residual, limiting the number of explanatory variables to be cautious about overfitting. We approximate both the cluster and household-level disturbances as either a normal distribution or a *t*-distribution with varying degrees of freedom.[22] Before proceeding to simulation, the estimated variance-covariance matrix is used to obtain GLS estimates of the first-stage parameters and their variance.

The estimates of poverty and inequality produced for Ecuador based on the above methodology have been described in greater detail in Demombynes et al (2004) and

[22] Rather than drawing from parametric distributions in our simulations, we can also employ a semi-parametric approach by drawing from observed residuals in the first stage model. Our results have generally been found to be quite robust to the choice of parametric or semi-parametric draws.

Elbers et al (2004).[23] These studies document that, in Ecuador, there is a considerable amount of heterogeneity across *parroquias,* in terms of both poverty and inequality. At the aggregate level, rural poverty rates are generally highest in the Eastern (Amazon) region. However, at the local level, pockets of very high poverty are also discernable in the central, mountainous, Sierra region and along the Coast. Elbers et al (2004) note that inequality levels vary markedly across *parroquias,* and emphasize that there should be no presumption that inequality levels are somehow lower in poorer communities.

Additional Control Variables

In addition to the community-level poverty and inequality estimates that are of primary interest in our investigation of the determinants of project choice, we include a number of control variables intended to capture the influence of other factors affecting project choice. From the 1990 census data, we calculate population figures at both the province and the *parroquia* level. The Census also allows us to calculate the percentage of the population in each *parroquia* that is of indigenous ethnic origin (based on language spoken). These demographic characteristics could be thought to influence project choice in a variety of ways, and in the case of population are also important to the assessment of whether the FISE program is well targeted at poor communities. Project documents note explicitly that the targeting of FISE funding was to be based on a combination of measured poverty and population of provinces (although the targeting was based on an ad-hoc map of poverty entirely unrelated to the poverty map outlined above). A simple correlation between presence of a FISE project and incidence of poverty at the parroquia level finds no significant association – suggesting very poor targeting. However, once the parroquia population is controlled for, the association becomes positive and strongly significant.[24] As was found by Paxson and Schady (2002) for the case of the FONCODES Social Fund in Peru, geographic targeting of Ecuador's FISE project

[23] A question of some importance to this study is whether the poverty map estimates should be seen to correspond the year 1990 (the year of the census) or 1994 (the year of the household survey). Hentschel et al (1999) argue that because the period between 1990 and 1994 was essentially one of economic stagnation it is not unreasonable to assume that the relationship observed between consumption in 1994 and household characteristics in that year was essentially unchanged from the relationship that held in 1990. As a result, one can view the poverty map as a reasonable snapshot of the spatial distribution of poverty in both years. For further discussion of these issues see also Elbers et al (2005).

[24] This evidence on targeting of FISE is also discussed in the next section and illustrated in Figures 3 & 4.

appears to have been rather good, in the sense of targeting those regions with large populations of poor people.

Census data are also exploited to construct proxies for different types of infrastructure "need" at the level of each *parroquia*, namely the percentage of households in each community that have no access to any toilet facilities, the percentage of households with access to piped water supply, and the percentage of children (5-12 year olds) enrolled at school.[25]

Following Schady (2000), we acknowledge the possible effect of electoral considerations by the party in office at the central government level on the distribution of FISE expenditures. As with Social Funds in many countries, the FISE was an independent agency set up in parallel to established ministries of the government and, in Ecuador, it was essentially run out of the President's office. It certainly is conceivable that a project such as FISE might be used by the Presidency for purposes other than the official objectives of the project – characterizing capture at the central, rather than local, level. To account for this possibility, we examine province-level results from the second round of the 1992 presidential elections, as published by the *Tribunal Supremo Electoral Ecuatoriano*, the agency overseeing the electoral process in Ecuador. This election was the last national election prior to the creation of FISE, and the Social Fund was in fact launched during the administration of PUR (Partido Unidad Republicana), which won that election. We calculate the share of votes obtained by the incumbent party (the PUR) in each province. The higher this percentage, the more inclined the central government might be to "reward" the province with FISE funding of some kind.[26] Descriptive

[25] Additional control variables capture geographic differences. The first is the distance of each *parroquia* from Quito, the capital of Ecuador and seat of the central government. This variable was computed as a linear distance (in kilometers), using the geographic coordinates of the *parroquias*. It is an imperfect estimate of proximity, as it does not measure actual travel time between two locations. Data on geographic coordinates was obtained from the *Sistema Integrado de Indicadores Sociales* del Ecuador, SIISE and it did not include all of the *parroquias* of Ecuador. For locations for which no geographic coordinates were available, we imputed those of the closest *parroquia*, based on visual inspection of a map. A second geographic variable takes the value of 1 if the *parroquia* is the administrative capital of the canton it is in. Such parroquias are plausibly more closely connected to the government than others.

[26] A second electoral variable that was calculated was the absolute deviation of the presidential vote in a particular province from 50%. This measure aims to capture the "non-marginality" of a particular province from a political point of view. As argued by Dixit and Londregan, (1996), the central government might wish to influence voting behavior in "swing" provinces – provinces in which either its majority is precarious, or it is not far from gaining a majority – through strategic allocations of FISE resources. The more "non-marginal" a province, on the basis of this argument, the less likely the province would receive a

statistics for all variables introduced in this section, and used in the empirical analysis that follows, are presented in Table 3.

5. Estimation and Results.

The two key results from the model of project choice presented in Section 3 were that: (i) controlling for the influence function (i.e. for idiosyncrasies in each community's decision-making process) and for inequality, poorer communities would be more likely to choose latrine projects; and (ii) controlling for the influence function and poverty incidence, more unequal communities would be less likely to choose latrine projects. Figures 1 and 2 show that the conditional patterns observed in the data conform to these predictions. Using a partial linear regression, Figure 1 plots the probability that a community has received a latrine project on the incidence of poverty (linearly controlling for the expenditure share of the top 1%) and shows a steady increase in that probability for the most part.[27]

Using a similar partial linear regression, Figure 2 presents the probability that the community has received a latrine project on our preferred measure of inequality (or elite dominance), namely the share of the richest 1% of the population in total consumption expenditure, this time (linearly) controlling for the headcount index. As that "expenditure share" rises (from 5% to 14%), the probability that the community chooses a latrine project falls from around 35% to around 5%. Both of these regressions are run over the sample of communities that received at least one FISE project over the period of analysis.

While these conditional correlations are consistent with the predictions of our model, they might be spurious due to other omitted variables. Table 4 therefore presents a multivariate analysis of the relationship between project choice on the one hand, and poverty and inequality on the other, where we are able to control for a number of other likely determinants of project receipt. The specification reported in Table 4 is a multinomial probit with three choice categories: (1) no FISE project at all; (2) at least one

FISE allocation. This variable was originally included in the regressions reported in the next section, but proved insignificant in all of them and was subsequently dropped.

[27] The downward turn at the high end of the distribution is due to several very small parroquias (all in the Oriente region) that have no latrine projects, but some other type of FISE project. It is possible that in such small communities in the sparsely populated Oriente, the need for latrines is not as high as in other communities.

FISE latrine project; (3) some FISE projects, but none involving latrine construction. Table 4 reports the multinomial probit coefficients with respect to the omitted category (1), i.e. no FISE projects.[28]

As the poverty concept that is relevant to our model of project choice is poverty incidence – $G(\tilde{y})$ – we use the headcount index as our poverty measure in Table 4. Since income inequality is proxying for the power of the elite, we use the expenditure share of the top p% of the population, where p varies from 1 to 20 in different specifications.[29] Additional controls include *parroquia* population, indigenous share of the population, share of the votes in the province where the *parroquia* is located which went to the winner of the last presidential election (1992), three measures related to project need in water, sanitation, and education, province population, distance to Quito, whether or not the *parroquia* is the seat of the canton government, and regional dummies. These variables were discussed in the previous section, and descriptive statistics for each are presented in Table 3.

After controlling for inequality (and all the other controls), poverty is a positive and significant determinant of the probability of receiving both categories of projects, vis-à-vis receiving none – a result which is likely to reflect spatial poverty targeting by FISE, as well as greater need. The relevant result for our model is the difference between the poverty coefficients in the latrine and other project columns, for each regression model. These are shown in Table 5.

Inequality negatively (and significantly) affects the chances of receiving a latrine project (vis-à-vis none), when measured by the expenditure share of the richest 1%. In terms of our model, however, the relevant test is whether the *difference* between the

[28] A multinomial probit is a natural specification for the community's problem of choosing whether to apply for no project at all, to include a latrine project on its application, or to apply only for non-latrine projects. These are discrete choices with more than two outcomes that do not have a natural ordering. Since some communities – the identity of which is not made public - are screened out by the FISE spatial poverty targeting, one might also consider an alternative in which there is first a selection stage into FISE, and subsequently a second stage of project selection. We therefore also estimate a probit model with selection (presented below under the robustness tests sub-section), and the results are remarkably similar.

[29] The reader familiar with small area estimation techniques described in the previous section may wonder how precise the estimates of the expenditure share of the top 1% are. While the estimates of the expenditure share of the top 1% are noisier than, say those of top 5% or 10%, they are reasonably precise. The average ratio of standard error to point estimate for the parroquias in our sample is 0.14 for the expenditure share of the top 1%, 0.08 for that of top 5%, and a quite precise 0.05 for that of top 10%. In any case, noisy measures of inequality would lead to attenuation bias, making the results presented in this section appear weaker than they actually are.

inequality coefficients in the latrine and other project columns is negative and significant. That test is reported in the last column of the table. The difference is negative in all five cases – suggesting that greater inequality does lower the probability of receiving a latrine project, as compared to receiving other projects – and is significant at the 10% level when inequality is measured by the expenditure shares of the top 1%, 3% or 5%.[30] Interestingly, the size (and significance) of these coefficients fall as we enlarge the size of the top group, whose expenditure share we use as our measure of inequality. In terms of our model, this suggests either a high income threshold ($\tilde{y}$), a very convex influence function (one in which decisions about project choice are very heavily influenced by a few dominant actors in each community[31]), or both.

Among the remaining independent variables, *parroquia* population is strongly positive and significant, which we interpret as reflecting the nature of the spatial targeting undertaken by FISE, which selected the communities to which project menus would be offered by the number of poor people they would affect. Figures 3 and 4 show the bivariate relationship between the probability of receiving any FISE project and poverty, measured by the headcount index and by the number of poor people respectively. Both are estimated as non-parametric regressions, so that the linearity of the second relationship is revealing. The indigenous share of the population is also positively and significantly associated with an increase in latrine projects (as compared to no projects), even after controlling for poverty and inequality.

In Table 4, we examined the results with villages receiving no projects as the reference category. Table 5 presents results from the exact same model, but with "other projects" as the reference category. Coefficients are shown only for the category of latrine projects. It can now be seen that poverty incidence is associated with a statistically significant increase in the probability of getting latrine projects, rather than other types of projects, in three of the six specifications (and the p-values are at or just above 0.10 for the other three specifications). Since it relates to differences across project types, this result is less likely to be driven by FISE targeting and more likely to reflect the project

[30] The reader might also note that the p-value of the coefficient for the expenditure share of top 10% is 0.12.

[31] As noted in Section 2, this is consistent with the view that a few "prime movers" play a key role in selecting projects for application. (De Haan, 2002; White, 2002).

selection process discussed in Section 3: other things equal, a greater population weight for the poor translates into greater political voice for them in choosing the projects they favor. This effect is not negligible: all else equal, a community with a headcount index of 0.77 is almost four times more likely to receive a latrine project than a community with a poverty incidence of 0.37.[32]

As illustrated in the previous table, inequality at the community level has a negative effect on the probability of receiving a latrine project compared with the receipt of other FISE projects. This effect (as well as its statistical significance) declines as our definition of the group of elite gets larger. The important role of inequality in project choice is the main result of the paper, and it is consistent with the model prediction that villages in which socioeconomic status (and therefore political power) is more highly concentrated are less likely to apply for and receive projects for an excludable good that is of value only to its poorer members. All else equal, the effect of moving from a parroquia at the 5th percentile of the inequality distribution (i.e. the expenditure share of top 1% is equal to 5.6%) to one at the 95th percentile (expenditure share equal to 9.6%) is a 10.6 percentage point decline in the likelihood of receiving a latrine project – from 19.6% to 9.0%. The decline is a much smaller 6.4 percentage points when the group of elite is defined to be those in the top 10% of the expenditure distribution.

It is interesting to note that the provincial share of the incumbent in the 1992 presidential election is negatively (and significantly) related to the probability of receiving latrine projects, as compared to others. If, as previously suggested, one is prepared to treat this variable as indicating some degree of FISE capture at the central level – in the sense that funds are allocated to reward political support, rather than exclusively to reduce poverty – then it would appear that the evidence is consistent with capture at both levels. Central agents would seem to reward supportive provinces by awarding project grants that are preferred by the local elites. Since we did not model central grant allocation, we regard this piece of evidence as merely suggestive, but it does

[32] The headcount index values of 0.37 and 0.77 represent the 5th and the 95th percentiles in the distribution of poverty across the rural parroquias in our sample. The probability that a community with a headcount index of 0.37 (and with all other variables equal to the sample mean) is 7%, while the same probability is 26% for the community with a headcount index of 0.77 (and, again, all other variables equal to the sample mean).

raise interesting questions about the relative degree of capture between national politicians and local elites.

Robustness Tests

We conduct two kinds of tests for the robustness of the poverty and inequality results. The first set of tests consists of adding variables and making other specification changes in the multinomial probit reported in Table 5. These changes are reported in Table 6 which, analogously to Table 5, reports coefficients for the latrine project category, with other projects as the reference. In column I of Table 6, we replace the headcount index (FGT (0)) with the squared poverty gap index (FGT (2)). We would not expect this particular measure to be a better indicator than the headcount index, which corresponds more closely to the relevant concept from the model, $G(\tilde{y})$. But it is nonetheless reassuring to find that the coefficient on inequality remains significant under alternative poverty measures.

An alternative interpretation for the negative impact of inequality on the likelihood of receiving latrine projects is that incomes are correlated with education, and it may be educational differences – rather than differences in power – that drive the result. While any reductions in the ability of the poor to make their voices heard or their project preferences known that arise from educational disparities would qualify as one kind of mechanism underlying the influence function discussed in Section 3, it turns out that income inequality remains significantly negative even after a measure of educational inequality is included. In Column II of Table 6, we use the share of the population with post-secondary education as an (inverse) measure of educational inequality. This measure is not significant, but the expenditure share of the richest 1% retains its sign and statistical significance. The results are also robust to including the expenditure share of the "middle class" (percentiles 60 – 99 or 60 - 95), but not when the elite is defined as the richest 10% (columns III to V).

The second robustness test is to replace the multinomial probit specification of project choice with a probit model with selection, estimated by maximum likelihood. Such a specification might be preferred if one thinks of the FISE grant allocation process as consisting of two clearly demarcated stages: first a set of communities is selected to

receive grants, and only then do these communities choose the *types* of projects they wish to receive. The information available in the FISE program documents suggests that selection processes were *not* that clear-cut. There were villages to which no menu was offered, on the grounds of having too few poor people. There also appear to have been villages that were eligible for the program, but from which no applications were received.[33] We therefore prefer the multinomial probit specification, where a hierarchical structure of selection is not imposed, and the three possible outcomes are not ranked.

Be that as it may, it turns out that the key poverty and inequality results are remarkably robust to the alternative, Heckman probit specification. Table 7 shows the selection probit equation and five alternative specifications for the main equation. The variable excluded from the main equation is the proportion of people in the province that voted for the incumbent.[34] As before, the incidence of poverty is positive and significant in both the selection equation (likely due to spatial poverty targeting from the center) and in the main equation, consistent with the model prediction.[35] The expenditure share of the elite (or inequality) variable also remains negative and statistically significant (for the top 1%, 3% or 5% of the population), with the coefficients remarkably similar to those from the multinomial probit estimation. Interestingly, inequality is not significant in the selection equation, suggesting that the effect of inequality really bears on the choice of project *type* – again consistent with the model in Section 3.[36]

[33] Although, unfortunately and as indicated in Section 4, the administrative FISE data set on which we draw does not include data on unsuccessful applications, or on communities visited by FISE teams from which no applications were received.

[34] Under a sequential view of the selection process, where communities are first identified to receive a project, and the type of project is chosen subsequently within the community, it makes sense to expect electoral variables at the central level to affect selection, but not to have any impact on the type of project a community applies for.

[35] Significance levels are, if anything, larger than in the multinomial probit specification.

[36] Several papers suggest that the relationship between local inequality, participation, and collective action is complex, and that while some inequality may be necessary to mobilize collective action, too much inequality may be harmful (see, for example, Dayton-Johnson and Bardhan 2002 and Khwaja 2002). In Appendix Figure 4, we present evidence reminiscent of this literature when we allow for a more flexible (non-linear) relationship between inequality and probability of project receipt. Conditional on various community characteristics, the likelihood that a community receives a FISE project increases initially with inequality, then declines.

6. Conclusions

The recent literature on decentralization of anti-poverty programs in developing countries has highlighted the need for quantitative empirical analysis of specific programs, with particular attention to any evidence relating to whether programs might be diverted from their original mandate, as a result of the influence of local elites. In this paper, we have analyzed a unique combination of data sets from the Ecuadorian Social Investment Fund (FISE), during 1993-1996. The combination of a detailed, parish-level poverty map, full program administrative data on project implementation, and province-level electoral results has allowed us to investigate the relationship between local income distribution and project choice in an unprecedented way.

To help our understanding of the role played by elites in community-level decision-making, we presented a simple model of project choice between local public goods and excludable goods that are particularly demanded by the poor. The model was designed specifically for this case study, where a key distinction among a menu of projects - all of which may appear to be pro-poor - was between projects that would benefit the entire community (through increased provision of local public goods, such as schooling, health clinics or roads), and those that provided excludable private goods that the poor were in great need of, but which brought no direct benefit to the elite.[37] The main examples of such private goods were latrines, and latrine construction projects accounted for 13% of all FISE projects.

Under the assumption that influence over local decision-making processes is a non-decreasing function of income, the model generates two basic predictions: other things equal, latrine projects would be more frequently found in poorer villages, and in less unequal villages. Inequality would reduce the probability that a community received latrine projects, controlling for poverty and need, through an "elite capture" mechanism: decision-making power would be more concentrated in the hands of those to whom additional latrines would be of no use, reducing the chances that they would be provided.

Both predictions are borne out empirically. Controlling for infrastructure need and a set of geographic and demographic variables, the poverty headcount is associated with a

[37] We acknowledge that building latrines for the poor may have positive health externalities for the non-poor. Whether the elite take this effect into consideration during the decision-making process is uncertain.

greater probability that the community receives a latrine project. With the same controls, inequality (measured by the expenditure share of the top 1%, 3%, 5%, etc. of the population) reduces the likelihood that latrine projects are chosen. This effect of inequality on project choice is smaller as we define the group of elite to be larger. The results are robust to empirically modeling project choice as a one-shot process (through a multinomial probit) or as a sequential, two-stage process (through a probit with selection). They are also robust to including an indicator of education inequality; to measuring poverty with an alternative FGT measure; and to the inclusion of some measures of middle-class clout.

These results are consistent with our simple model of project choice under political inequality. We interpret them as providing support to the hypothesis that even programs which are targeted to the poor, and which only offer projects from a menu that is designed with poverty-reduction in mind, are vulnerable to capture by local elites. While channeling funds away from latrine construction towards school-building may not appear as a grave distortion, the point is that elites are capable of affecting the outcomes of participatory processes, even when they are reasonably carefully designed. In their essence, these results are similar to those found by Galasso and Ravallion (2005) for the *Food for Education* program in Bangladesh, where greater land inequality was associated with worse targeting outcomes.

As evidence of this kind mounts, there may be implications for the design of hundreds of Social Funds and other community-driven development programs currently in operation or preparation around the developing world. These implications are not necessarily that such programs should be abolished or that they should be centrally administered. In fact, our empirical results suggest that capture at the center may also be occurring. In the case of Ecuador's FISE, one may be tempted to think of laying down clearer rules for the manner in which decisions must be taken within each community, with a view to making it harder for the more powerful to exercise an unduly large amount of influence.[38]

[38] This is also related to the Rosenzweig and Foster (2003) result that the provision of pro-poor local public goods increases with poverty in Indian villages, but only when effective local democracy (elected *panchayats*) is in place.

Appendix: Proofs of the Propositions in Section 2

Proof of Proposition 1:

In village j, order individuals $i \in \{1,...,I_j\}$ by their income levels y_i.
Order $\pi_1 = \{\Delta x_i = 1, \forall i \in j; \Delta g_j = 0\}$ and $\pi_2 = \{\Delta x_i = 0, \forall i \in j; \Delta g_j = \Delta g_j\}$ by their first elements. We thus have a set of voters that is a chain, with the order $\geq$ defined over y_i, and a chain of social alternatives $\Pi = \{\pi_1, \pi_2\}$, where $\pi_1 > \pi_2$. Denote the weak preference relation of individual *i* with income y_i, of project *a* over project *b* as $\pi_a R_i \pi_b$, whose asymmetric factor (strict preference) is denoted $\pi_a P_i \pi_b$. Indifference is denoted $\pi_a I_i \pi_b$.

(i) Case I: $U(c,1,g_j) - U(c,0,g_j) \leq U(c,0,g_j + \Delta g_j) - U(c,0,g_j)$
Since x =1 if $y_i \geq \tilde{y}$, $\pi_2 P_i \pi_1$ for i: $y_i \geq \tilde{y}$.
Since $U(c,1,g_j) - U(c,0,g_j) \leq U(c,0,g_j + \Delta g_j) - U(c,0,g_j)$; $\pi_2 P_i \pi_1$ for i: $y_i < \tilde{y}$. So π_2 is preferred unanimously, which is a trivial case of order restriction (OR).

(ii) Case II: $U(c,1,g_j) - U(c,0,g_j) > U(c,0,g_j + \Delta g_j) - U(c,0,g_j)$
Since x =1 if $y_i \geq \tilde{y}$, $\pi_2 P_i \pi_1$ for i: $y_i \geq \tilde{y}$.
Since x = 0 if $y_i < \tilde{y}$ and $U(c,1,g_j) - U(c,0,g_j) > U(c,0,g_j + \Delta g_j) - U(c,0,g_j)$; $\pi_1 P_i \pi_2$ for i: $y_i < \tilde{y}$.
Then $\{y_i : \pi_2 P_i \pi_1\} > \{y_i : \pi_2 I_i \pi_1\} > \{y_i : \pi_1 P_i \pi_2\}$, where > is the strict set order defined by S > S' if for all x ∈ S and z ∈ S', x>z. But this is the condition for the preference profile to satisfy order restriction (OR). By theorem 3 in Gans and Smart (1996), a preference profile satisfies order restriction if and only if it satisfies Single Crossing (SC). QED.

Proof of Proposition 2:

Prob (π_1 *is chosen)* = Prob$\left(\int_0^{\tilde{y}} \int_{\underline{\varepsilon}}^{\bar{\varepsilon}} \left[v\left(\frac{y_{ij}}{\mu_j} \right) + \varepsilon_i \right] dH(\varepsilon) dG_j(y) > \frac{1}{2} \right)$, where this latter probability is defined over *H(ε).* Note that:

(i) an increase in the incidence of poverty G($\tilde{y}$) that leaves the Lorenz curve unaffected will also leave all relative incomes $\frac{y_{ij}}{\mu_j}$ unchanged;

(ii) $v\left(\frac{y_{ij}}{\mu_j}\right)+\varepsilon_{ij}\geq 0, \forall y_{ij}$

(iii) $\int_0^{\tilde{y}}\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left[v\left(\frac{y_{ij}}{\mu_j}\right)+\varepsilon_i\right]dH(\varepsilon)dG_j(y)+\int_{\tilde{y}}^{\infty}\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left[v\left(\frac{y_{ij}}{\mu_j}\right)+\varepsilon_i\right]dH(\varepsilon)dG_j(y)=1.$

It follows that an increase in G($\tilde{y}$) is simply a transfer of probability mass from the second term in (iii) to the first. Thus

$$\Delta G(\tilde{y})>0 \Rightarrow \Delta\int_0^{\tilde{y}}\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left[v\left(\frac{y_{ij}}{\mu_j}\right)+\varepsilon_i\right]dH(\varepsilon)dG_j(y)>0 \Rightarrow \Delta \Pr ob(\pi_1)>0.$$ QED.

Proof of Proposition 3:

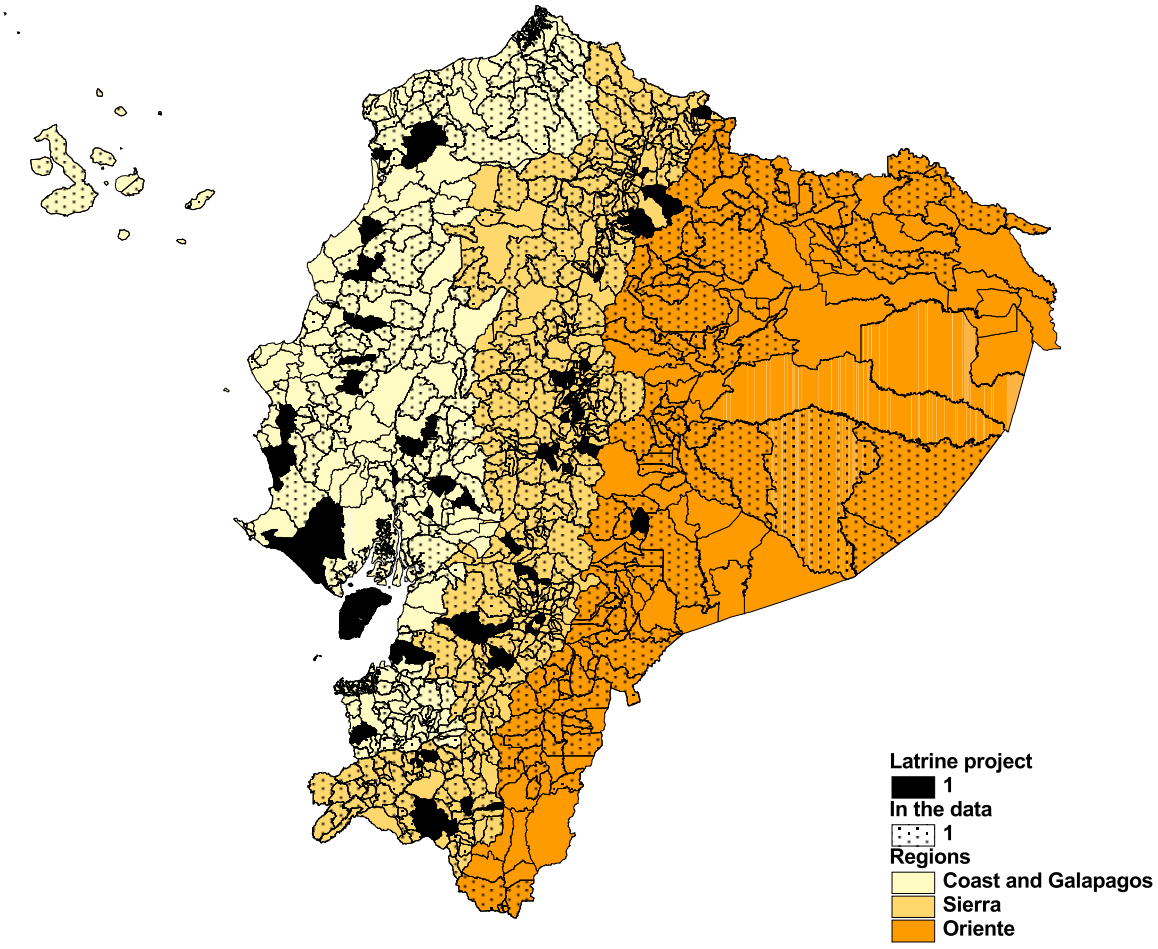
Prob (π_1 *is chosen)* = Prob($\int_0^{\tilde{y}}\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left[v\left(\frac{y_{ij}}{\mu_j}\right)+\varepsilon_i\right]dH(\varepsilon)dG_j(y)>\frac{1}{2}$) , where this latter probability is defined over *H(ε).*

Note that: $v'\left(\frac{y_{ij}}{\mu_j}\right)\geq 0, \forall i, j$

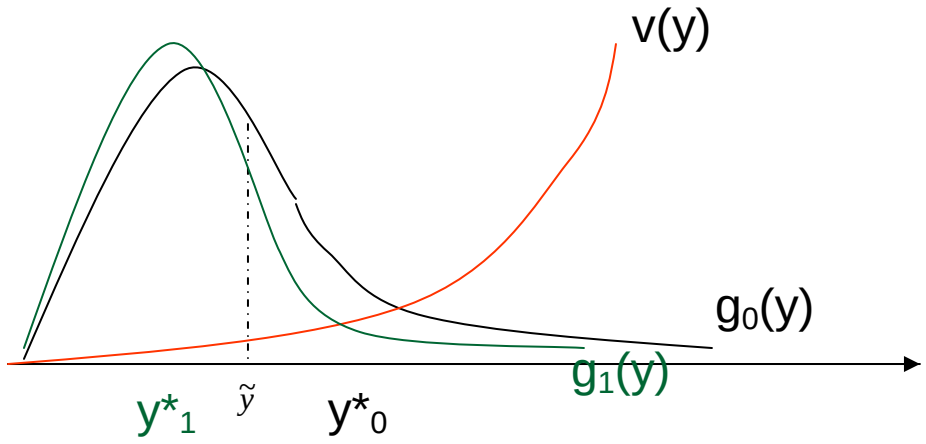
Any income transfer from $i: y_{ij}<\tilde{y}$ to i': $y_{i'j}>\tilde{y}$, with no change in the v(.) function, lowers $\int_0^{\tilde{y}}\int_{\underline{\varepsilon}}^{\bar{\varepsilon}}\left[v\left(\frac{y_{ij}}{\mu_j}\right)+\varepsilon_i\right]dH(\varepsilon)dG_j(y)$, and thus lowers Prob ($\pi_1$ *is chosen).* QED.

Appendix: Figures

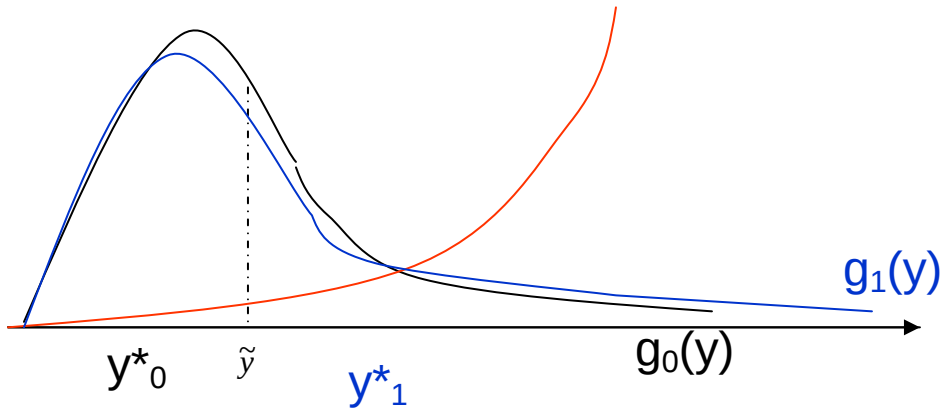
Appendix Figure 1: Location of FISE latrine and other projects (by canton) in Ecuador, 1993-1996.



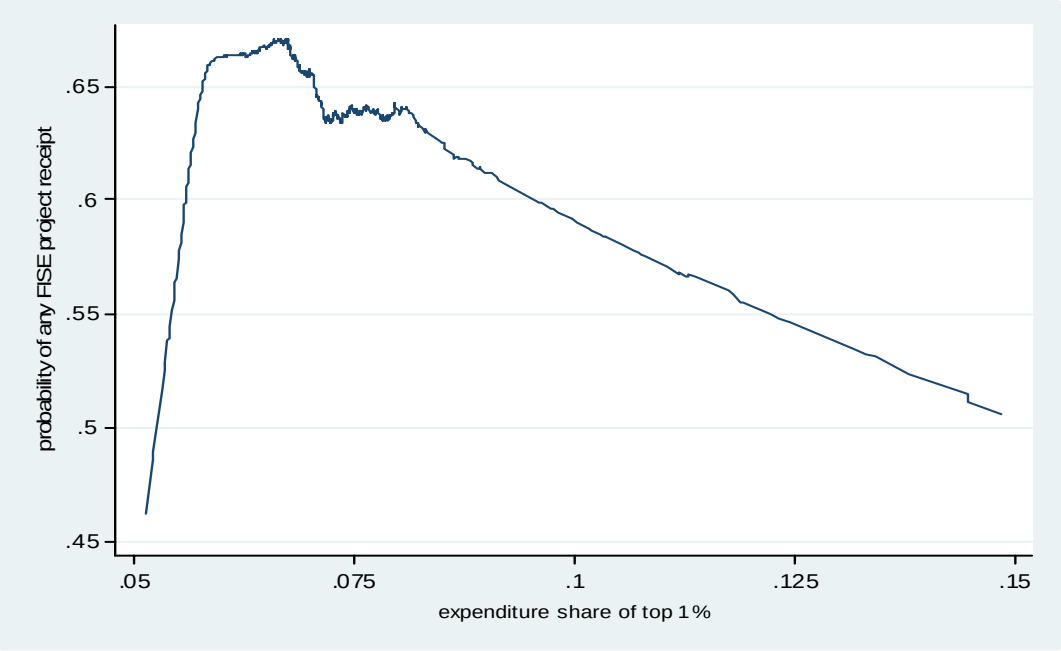
Appendix Figure 2: A Lorenz-preserving increase in poverty can lead to a shift in the political outcome towards the x-good project.



Appendix Figure 3: A poverty neutral increase in inequality arising from income transfers from the poor to the non-poor can lead to a shift in the political outcome towards the g-good project.



Appendix Figure 4: Local Inequality and Probability of FISE Project Receipt



The results are obtained using the PLREG (partial linear regression) command in STATA, linearly controlling for all the explanatory variables used in the selection equation of the probit with selection model (Table 7).

References

Bardhan, P. and Mookherjee, D., 2000. Capture and Governance at the Local and National Levels. *AEA Papers and Proceedings* **90** (2), 135-139.

Bardhan, P. and Mookherjee, D., 2005. Decentralizing Antipoverty Program Delivery in Developing Countries. *Journal of Public Economics* **89**, 675-704.

Bénabou, R. 2000. Unequal Societies: Income Distribution and the Social Contract. *American Economic Review* **90** (1), 96–129.

Chase, R.S., 2002. Supporting Communities in Transition: The Impact of the Armenian Social Investment Fund. *World Bank Economic Review* **16** (2), 219-240.

Chase, R.S. and Sherburne-Benz, L., 2001. Impact Evaluation of the Zambia Social Fund. Unpublished manuscript, World Bank, Social Protection, Washington, DC.

Dasgupta, I. and Kanbur, R., 2001. Class, Community, Inequality. Working Ppaer 2001-24. Department of Applied Economics and Management. Cornell University, Ithaca, NY.

Dayton-Johnson, J. and Bardhan, P., 2002. Inequality and Conservation on the Local Commons: A Theoretical Exercise. *Economic Journal* **112** (481), 459-703.

Demombynes, G., Elbers, C., Lanjouw, J.O., Lanjouw, P., and Özler, B., 2004. Producing an Improved Geographic Profile of Poverty. Methodology and evidence from Three Developing Countries, in van der Hoeven, R., Shorrocks, A. (eds.), Growth, Inequality, and Poverty – Prospects for Pro-Poor Economic Development, Oxford University Press.

De Haan, A., Holland, J., and Kanji, N., 2002. Social Funds: An Effective Instrument to Support Local Actions for Poverty Reduction? *Journal of International Development* **14**, 643-652.

Dixit, A. and Londregan, J., 1996. The Determinants of Success of Special Interests in Redistributive Politics. *Journal of Politics* **58** (4), 1132-1155.

Elbers, C., Lanjouw, J.O., and Lanjouw, P., 2002. Micro-level Estimation of Welfare. Policy Research Working Paper No. 2911, The World Bank, Washington, D.C.

Elbers, C., Lanjouw, J.O., and Lanjouw, P., 2003. Micro-level Estimation of Poverty and Inequality. *Econometrica* 71(1), 355-364.

Elbers, C., Lanjouw, P., Mistiaen, J.A., Özler, B., and Simler, K., 2004. On the Unequal Inequality of Poor Communities. *World Bank Economic Review* **18**(3), 401-421.

Elbers, C., Lanjouw, J.O., and Lanjouw, P., 2005. Imputed Welfare Estimates in Regression Analysis. *Journal of Economic Geography* **5**, 101-118.

Ferreira, F. H. G. 2001. Education for the Masses? The Interaction between Wealth, Educational and Political Inequalities. *Economics of Transition* **9** (2), 533–552.

Galasso, E. and Ravallion, M., 2005. Decentralized Targeting of an Antipoverty Program. *Journal of Public Economics* **89**, 705-727.

Gans, J.S. and M. Smart. 1996. Majority voting with single-crossing preferences. *Journal of Public Economics*, **59**, 219-237.

Hentschel, J., Lanjouw, J.O., Lanjouw, P., and Poggi, J., 1999. Combining Survey Data with Census Data to Construct Spatially Disaggregated Poverty Maps: A Case Study of Ecuador. *World Bank Economic Review,* **14** (1), 147-166.

Khwaja, A., 2002. Is Increasing Community Participation Always a Good Thing? *Journal of the European Economic Association* **2**(2), 427-436.

Mansuri, G. and Rao, V., 2004. Community-Based and –Driven Development: A Critical Review. *World Bank Research Observer* **19** (1), 1-39.

Newman, J., Pradhan, M., Rawlings, L., Ridder, G., Coa, R., and Evia, J.L., 2002. An Impact Evaluation of Education, Health, and Water Supply Investments by the Bolivian Social Investment Fund. *World Bank Economic Review* **16** (2), 241-274.

Paxson, C. and Schady N.R., 2002. The Allocation and Impact of Social Funds: Spending on School Infrastructure in Peru. *World Bank Economic Review* **16** (2), 297-319.

Platteau, J.-P. and Gaspart, F., 2003. The Risk of Resource Misappropriation in Community-Driven Development. Centre for Research on the Economics of Development. Namur, Belgium.

Platteau, J.-P., 2004. Monitoring Elite Capture in Community-Driven Development. *Development and Change* **35** (2), 223-246.

Pradhan, M. and Rawlings, L., 2002. The Impact and Targeting of Social Infrastructure Investments: Lessons from the Nicaraguan Social Fund. *World Bank Economic Review* **16** (2), 275-295.

Rao, V. and Ibáñez, A.M., 2005. The Social Impact of Social Funds in Jamaica: A 'Participatory Econometric' Analysis of Targeting, Collective action, and Participation in Community-Driven Development. *Journal of Development Studies* **41** (5), 788-838.

Rothstein, P. 1990. Order restricted preferences and majority rule. *Social Choice and Welfare*, **7**, 331-342.

Rosenzweig, M. and Foster, A., 2003. Democratization, Decentralization, and the Distribution of Local Public Goods in a Poor Rural Economy. BREAD Working Paper No. 010.

Schady, N.R., 2000. The Political Economy of Expenditures by the Peruvian Social Fund. *American Political Science Review* **94** (2), 289-304.

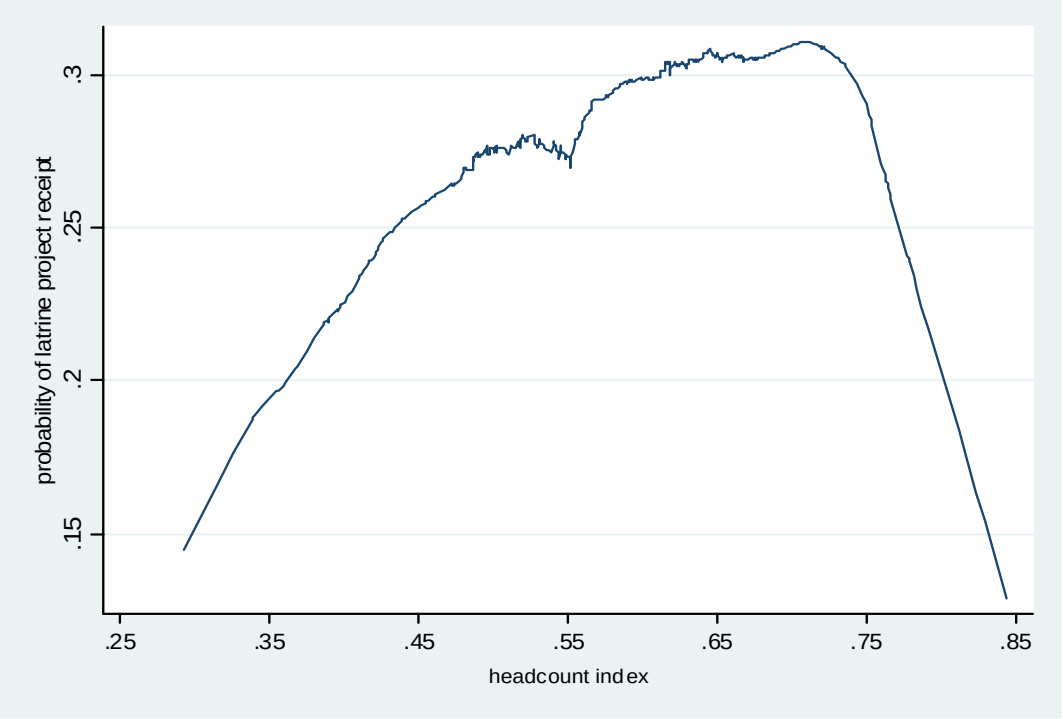
Van Domelen, J., 2002. Social Funds: Evidence on Targeting, Impacts, and Sustainability. *Journal of International Development* **14**, 627-642.

White, H., 2002. Social Funds: A Review of the Issues. *Journal of International Development* **14**, 605-610.

World Bank, 1994. Staff Appraisal Report: Ecuador Third Social Development Project Social Investment Fund. The World Bank, Washington, D.C.

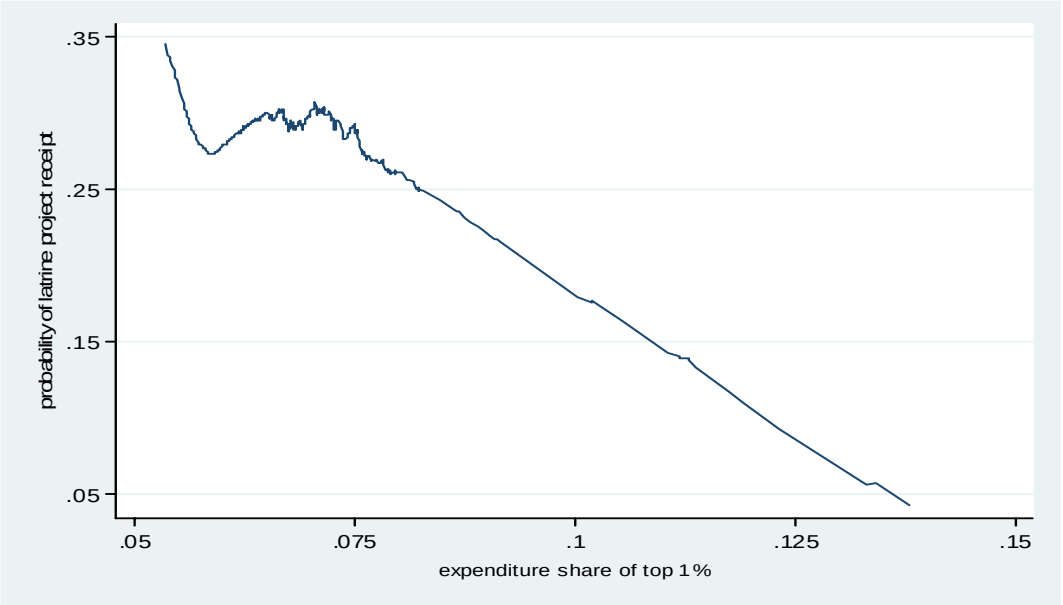
World Bank, 2003. Evaluating Social Funds: A Cross-Country Analysis of Community Investments. The World Bank, Washington, DC.

Figure 1: Headcount Index and Probability of Latrine Project Receipt



The results are obtained using the PLREG (partial linear regression) command in STATA, linearly controlling for the expenditure share of top 1%.

Figure 2: Local Inequality and Probability of Latrine Project Receipt



The results are obtained using the PLREG (partial linear regression) command in STATA, linearly controlling for the headcount index.

Figure 3: Headcount Index and Probability of FISE Project Receipt

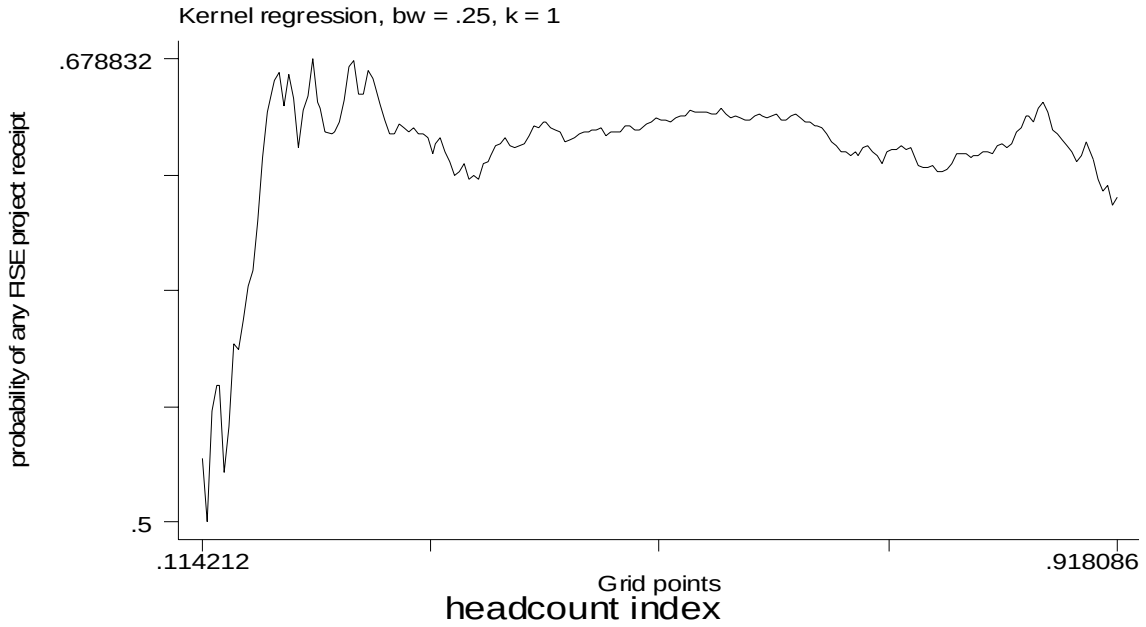


Figure 4: Number of Poor and Probability of FISE Project Receipt

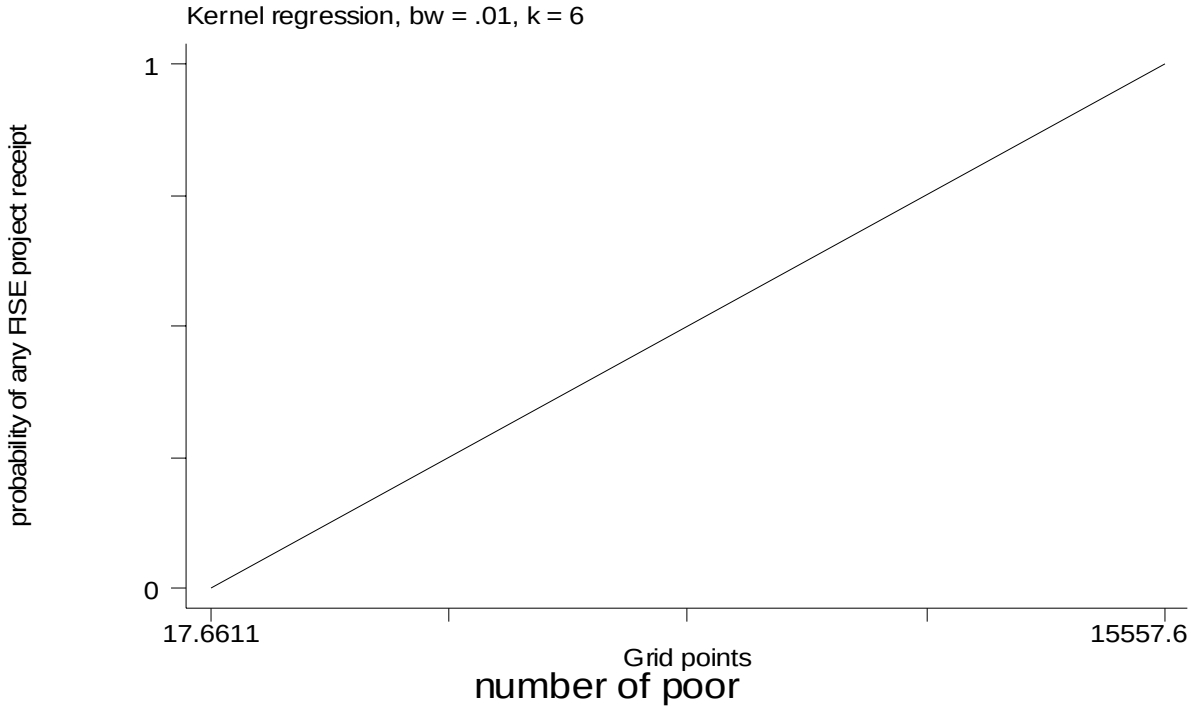


Table 1: Access to toilets and latrines by quintiles of per capita household consumption

quintile	toilet	latrine	None
Poorest quintile	44.5%	12.0%	43.4%
2nd	45.8%	15.4%	38.7%
3rd	51.1%	18.4%	30.5%
4th	56.7%	17.4%	25.9%
Richest quintile	73.9%	9.7%	16.4%
Richest 1%	98.1%	1.9%	0.0%

Table 2: Distribution of FISE Projects by Type, 1993-1996

Type of project	Number of Projects	Share of projects
School (infrastructure)	920	32
School (equipment and materials)	977	34
Latrines	377	13
Sewerage	132	5
Water Supply	129	5
Health	115	4
Other	226	7
TOTAL	2876	100

* Other projects include road works, agro-industry, irrigation, and erosion, crafts, adult training centers, statues, murals and public laundries.

Table 3: Descriptive Statistics

Variable	Mean	Median	Standard Deviation
% of parroquias with at least one FISE project	65	100	48
% of parroquias with at least one **latrine** project *(out of 539 parroquias with projects)*	28	0	45
Province population	546,354	364,682	621,020
Parroquia population	4,185	2,856	4,118
Distance to Quito (in kilometers)	244	212	178
% of parroquias that are canton capitals	11	0	31
% speaking indigenous language at home	8.4	0.7	19
% voted for incumbent in presidential elections (PUR2)	56	57	11
% with no access to any toilet facilities	58.1	59.8	23.5
% with access to piped water	35.2	32.4	26.1
% of 5-12 year-olds enrolled in school	76.9	78.5	9.8
Headcount index	0.58	0.59	0.12
Expenditure share of top 1% (%)	7.1	6.7	1.7
Expenditure share of top 3% (%)	14.8	14.4	1.9
Expenditure share of top 5% (%)	20.8	20.3	2.2
Expenditure share of top 10% (%)	32.3	31.8	2.7
Expenditure share of top 20% (%)	48.8	48.3	2.8
Gini Index	0.39	0.39	0.037

These statistics are based on 835 **rural** parroquias in Ecuador. 539 parroquias have at least one FISE project while 236 have none.

Table 4: Determinants of receiving latrine projects or other projects

	Regression model I		Regression model II		Regression model III		Regression model IV		Regression model V		Test of equality of coefficients
	latrine	other	Latrine	other	latrine	other	latrine	other	latrine	other	
1990 parroquia population	18.48 (0.00)	11.18 (0.00)	18.76 (0.00)	11.20 (0.00)	18.74 (0.00)	11.13 (0.00)	18.62 (0.00)	11.06 (0.00)	17.87 (0.00)	10.26 (0.00)	
% speaking an indigenous language at home	1.56 (0.01)	0.79 (0.09)	1.50 (0.01)	0.66 (0.17)	1.48 (0.01)	0.66 (0.17)	1.40 (0.01)	0.61 (0.20)	1.39 (0.01)	0.67 (0.15)	
% who voted for the incumbent in 1992	-0.74 (0.52)	2.47 (0.01)	-0.77 (0.50)	2.41 (0.01)	-0.78 (0.50)	2.40 (0.02)	-0.86 (0.45)	2.39 (0.02)	-1.10 (0.33)	2.17 (0.03)	
% with no access to any toilet facilities	-0.68 (0.25)	-0.46 (0.34)	-0.69 (0.24)	-0.53 (0.27)	-0.69 (0.24)	-0.53 (0.27)	-0.74 (0.21)	-0.56 (0.24)	-0.71 (0.22)	-0.50 (0.30)	
% with access to piped water supply	0.03 (0.96)	0.34 (0.38)	0.03 (0.95)	0.32 (0.40)	0.02 (0.97)	0.31 (0.42)	0.01 (0.98)	0.31 (0.42)	0.06 (0.90)	0.37 (0.33)	
% of children 5-12 enrolled in school	-0.63 (0.52)	-0.05 (0.95)	-0.54 (0.58)	0.08 (0.92)	-0.50 (0.60)	0.04 (0.96)	-0.45 (0.64)	0.10 (0.90)	-0.36 (0.71)	0.15 (0.84)	
Headcount Index (fgt_0)	3.59 (0.00)	1.70 (0.04)	3.54 (0.00)	1.79 (0.03)	3.51 (0.00)	1.80 (0.03)	3.58 (0.00)	1.91 (0.03)	3.57 (0.00)	1.88 (0.03)	
Expenditure share of top 1%	-16.23 (0.05)	-1.20 (0.78)									-15.03 (0.07)
Expenditure share of top 3%			-7.58 (0.21)	3.63 (0.37)							-11.21 (0.05)
Expenditure share of top 5%					-5.37 (0.29)	2.78 (0.45)					-8.15 (0.10)
Expenditure share of top 10%							-2.48 (0.54)	3.56 (0.22)			-6.05 (0.12)
Expenditure share of top 20%									-1.43 (0.69)	2.91 (0.27)	-4.31 (0.22)
Constant	-2.84 (0.05)	-3.09 (0.00)	-2.85 (0.08)	-3.80 (0.00)	-2.86 (0.09)	-3.80 (0.00)	-3.18 (0.10)	-4.47 (0.00)	-3.23 (0.16)	-4.65 (0.01)	
Observations	835		835		835		835		835		

Results are obtained using the "mprobit" command in Stata to implement a multinomial probit. In each regression model, having received 'no project' is the base outcome. P-values are in parentheses. In the last column, the p-values in parentheses refer to a chi-square test for top'i' [latrine] = top'i' [other], where i = 1, 3, 5, 10, or 20. The test statistics for the equality of coefficients for all the variables presented in this table can be seen in Table 2. The regression models also include (not reported here) regional controls, province population, distance to Quito, and a dummy variable for whether the parroquia is a canton capital or not.

Table 5: Determinants of receiving at least one latrine project vs. other projects

	I	II	III	IV	V	VI
1990 parroquia population	7.42 (0.00)	7.67 (0.00)	7.73 (0.00)	7.68 (0.00)	7.61 (0.00)	7.55 (0.00)
% speaking an indigenous language at home	0.76 (0.13)	0.83 (0.10)	0.81 (0.11)	0.78 (0.12)	0.72 (0.15)	0.58 (0.25)
% who voted for the incumbent in 1992	-3.17 (0.00)	-3.14 (0.00)	-3.13 (0.00)	-3.20 (0.00)	-3.27 (0.00)	-3.33 (0.00)
% with no access to any toilet facilities	-0.23 (0.68)	-0.18 (0.75)	-0.18 (0.75)	-0.19 (0.74)	-0.21 (0.71)	-0.37 (0.52)
% with access to piped water supply	-0.33 (0.47)	-0.31 (0.49)	-0.31 (0.49)	-0.31 (0.49)	-0.31 (0.49)	-0.38 (0.40)
% of children 5-12 enrolled in school	-0.60 (0.53)	-0.63 (0.51)	-0.55 (0.56)	-0.57 (0.55)	-0.51 (0.59)	-0.33 (0.73)
Headcount Index (fgt_0)	1.91 (0.07)	1.76 (0.09)	1.71 (0.10)	1.67 (0.12)	1.69 (0.11)	2.07 (0.07)
Expenditure share of top 1%	-14.99 (0.07)					
Expenditure share of top 3%		-11.21 (0.05)				
Expenditure share of top 5%			-8.17 (0.09)			
Expenditure share of top 10%				-6.07 (0.12)		
Expenditure share of top 20%					-4.34 (0.22)	
Gini Index						-0.04 (0.99)
Constant	0.24 (0.86)	0.94 (0.55)	0.94 (0.57)	1.29 (0.49)	1.42 (0.53)	-0.94 (0.59)
Observations	835	835	835	835	835	835

Results are obtained using the "mprobit" command in Stata to implement a multinomial probit. The base outcome is the parroquia receiving 'no **latrine** project, but other projects'. The regression models also include (not reported here) regional controls, province population, distance to Quito, and a dummy variable for whether the parroquia is a canton capital or not. P-values are in parentheses.

Table 6: Are the results robust to the inclusion of other variables?

	I	II	III	IV	V
1990 parroquia population	7.40 (0.00)	7.68 (0.00)	7.40 (0.00)	7.95 (0.00)	8.04 (0.00)
% speaking an indigenous language at home	0.71 (0.18)	0.88 (0.09)	0.76 (0.14)	0.85 (0.10)	0.87 (0.09)
% who voted for the incumbent in 1992	-3.17 (0.00)	-3.06 (0.00)	-3.12 (0.00)	-2.94 (0.01)	-2.92 (0.01)
% with no access to any toilet facilities	-0.16 (0.78)	-0.28 (0.61)	-0.28 (0.63)	-0.27 (0.64)	-0.29 (0.61)
% with access to piped water supply	-0.36 (0.43)	-0.25 (0.59)	-0.37 (0.42)	-0.38 (0.40)	-0.42 (0.35)
% of children 5-12 enrolled in school	-0.50 (0.60)	-0.51 (0.60)	-0.55 (0.57)	-0.49 (0.61)	-0.54 (0.57)
Headcount Index (fgt_0)		1.22 (0.28)	2.10 (0.06)	2.12 (0.06)	2.22 (0.05)
Poverty gap squared (fgt_2)	4.37 (0.11)				
Expenditure share of top 1%	-17.33 (0.03)	-13.55 (0.10)	-16.60 (0.05)		
% of individuals with post-secondary education		-3.60 (0.13)			
Expenditure share of 60-99 percentile			2.86 (0.57)		
Expenditure share of top 5%				-7.97 (0.11)	
Expenditure share of 60-95 percentile				9.27 (0.20)	
Expenditure share of top 10%					-3.71 (0.38)
Expenditure share of 60-90 percentile					17.20 (0.07)
Constant	0.82 (0.52)	0.68 (0.63)	-1.62 (0.66)	-4.04 (0.34)	-6.43 (0.17)
Observations	835	835	835	835	835

Results are obtained using the "mprobit" command in Stata to implement a multinomial probit. The base outcome is the parroquia receiving 'no **latrine** project, but other projects'. The regression models also include (not reported here) regional controls, province population, distance to Quito, and a dummy variable for whether the parroquia is a canton capital or not. P-values are in parentheses.

Table 7: Determinants of receiving at least one latrine project
(Probit with selection)

	Selection equation	I Main equation	II Main equation	III Main equation	IV Main equation	V Main equation
1990 parroquia population	10.26 (0.00)	9.16 (0.00)	8.89 (0.00)	9.10 (0.00)	9.13 (0.00)	9.12 (0.00)
% speaking an indigenous language at home	0.73 (0.03)	0.84 (0.02)	0.77 (0.03)	0.80 (0.03)	0.81 (0.03)	0.76 (0.04)
% who voted for the incumbent in 1992	1.31 (0.04)					
% with no access to any toilet facilities	-0.47 (0.16)	-0.40 (0.32)	-0.35 (0.39)	-0.34 (0.40)	-0.33 (0.42)	-0.35 (0.39)
% with access to piped water supply	0.19 (0.48)	-0.10 (0.77)	-0.17 (0.60)	-0.14 (0.67)	-0.15 (0.65)	-0.15 (0.65)
% of children 5-12 enrolled in school	0.02 (0.97)	-0.37 (0.58)	-0.46 (0.50)	-0.48 (0.48)	-0.39 (0.55)	-0.38 (0.56)
% of individuals with post-secondary education	-0.21 (0.87)	-2.70 (0.11)				
Headcount Index (fgt_0)	1.79 (0.00)	1.55 (0.06)	2.06 (0.01)	2.01 (0.01)	1.94 (0.01)	1.97 (0.01)
Expenditure share of top 1%	-2.25 (0.48)	-11.08 (0.08)	-12.60 (0.05)			
Expenditure share of top 3%				-8.49 (0.05)		
Expenditure share of top 5%					-6.59 (0.07)	
Expenditure share of top 10%						-4.31 (0.15)
Constant	-2.23 (0.00)	-1.83 (0.05)	-2.16 (0.02)	-1.72 (0.11)	-1.65 (0.15)	-1.64 (0.22)
Observations	835	540	540	540	540	540
LR test of independent equations: chi2(1)		2.21 (0.14)	2.52 (0.11)	2.68 (0.10)	2.54 (0.11)	2.79 (0.09)

Results are obtained using the "heckprob" command in Stata to implement a probit model with selection. Selection equation refers to the 1st-stage model (of whether a community receives any Social Fund project or not) and main equation refers to the 2nd-stage model (of receipt of at least one latrine project by the community). Percentage of individuals who voted for the incumbent in 1992 is used as exclusion restrictions in the selection model. It is significant at the 5% level in all five regression models presented here. The regression models also include (not reported here) regional controls, province population, distance to Quito, and a dummy variable for whether the parroquia is a canton capital or not. P-values are in parentheses.