

# Reaching Poor Areas in a Federal System

*Martin Ravallion*

The aid allocation to a province in a federal system should depend not only on how poor the province is but on how successfully it discriminates in favor of poor areas in public spending. In Argentina, stronger incentives are needed.



## Summary findings

Ravallion studies how well a federal antipoverty program reaches poor areas, taking the reactions of lower levels of government into account.

He studies performance in reaching poor areas before and after World Bank-sponsored reforms in Argentina's antipoverty program. Program resources were substantially reallocated across provinces when Argentina's Trabajar 1 program was replaced by Trabajar 2, with increased spending and greater targeting to poor areas.

Overall, performance in reaching poor areas (regardless of province) improved nationally. About a third of the gain in the program's ability to reach poor areas was attributed to the program's greater ability to reach poor provinces. The rest was attributed to better targeting of poor areas within provinces.

The provinces differed greatly in ability to reach poor areas. History mattered. Differences in performance after

reform partly reflected differences under the old program.

Controlling for those factors, however, poorer provinces were less successful in targeting their poor areas.

A higher provincial poverty rate attracted more central spending, which tended to result in more pro-poor spending within provinces. But even with greater central spending on poor provinces, poorer provinces were less successful at discriminating in favor of their poor areas. Decentralization generated substantial horizontal inequality in public spending on poor areas.

The center clearly needs to give provincial governments stronger incentives to target the poor. Allocations to a province should depend not only on how poor the province is but on how successfully it discriminates in favor of poor areas. The results of this study suggest that stronger incentives are needed.

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# Reaching Poor Areas in a Federal System

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## 1. Introduction

Anti-poverty programs often rely heavily on the existing fiscal federalism. The central government—aiming to fight poverty nationally—targets poor provinces, leaving provincial governments to reach their own poor. This is administratively and politically easier than finer targeting, and appears to be increasingly common.

The literature on fiscal decentralization has often emphasized the importance of central redistribution between lower levels of government.<sup>2</sup> It is also recognized in principle that the outcomes will depend on the behavior of provincial governments.<sup>3</sup> The latter need not share the center's objectives, or may face different constraints in pursuing them, such as tighter financial constraints, or constraints arising from the existence of mobility.<sup>4</sup> Without successful efforts by provincial governments to target their poor, even dramatic redistributions rich provinces to poor ones may have little impact on poverty nationally.<sup>5</sup>

One can expect provinces to differ in a number of ways that could matter to the welfare outcomes of federal programs. Some provincial governments will no doubt care more about the poor than others; one often finds heterogeneity in such "social preferences" even within one country. However, outcomes could differ even without differences in the social preferences of

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<sup>2</sup> The classic treatment is Oates (1972). Recent discussions include Bahl and Linn (1992), Shah (1994), and Bird et al., (1995), and Inman and Rubinfeld (1997).

<sup>3</sup> As one textbook on public finance puts it: "Since the central authorities do not control the local authorities, the effects of federal programmes need not be those intended; and the central authorities must take the reactions of the communities into account" (Atkinson and Stiglitz, 1980, p.551).

<sup>4</sup> On the implications of inter-jurisdictional residential mobility for efforts to target the poor in a federal system see Brown and Oates (1987). Competition between provinces, given capital mobility across jurisdictional borders, can also influence provincial spending choices (Keen and Marchand, 1997).

<sup>5</sup> For evidence see Datt and Ravallion (1993) and Ravallion (1993).

provincial governments. One of the relevant differences between provinces is how poor they are. In Argentina, for example, the poverty rate (as typically measured in that country) is over three times higher in the poorest province than in the least poor. Poorer provinces may well have a harder time giving priority to the poor, while still being within the budget constraints set by the center. The fact of being a poor province could thus diminish performance in reaching the poor through public spending. If borne out by the evidence, this holds implications for understanding why spatial concentrations of poverty persist in the absence of suitable redistribution from the center; poor provinces get poor governments, which perpetuate their poverty.

This paper explores these issues for a program in Argentina, which is studied before and after a World Bank supported reform and expansion. By studying a specific program at one time in one country, I hope to identify effects which would otherwise be hard to isolate. A measure of success at poor-area targeting is proposed, namely the regression coefficient of program spending on the welfare indicator. A decomposition of this measure is used to assess the contribution of the center's provincial reallocation—versus intra-provincial targeting—to the program's overall performance. Armed with a consistent measure of performance at province level, the paper then investigates the determinants of why some provinces did better than others at reaching their poor areas, and what implications this might hold for the center.

The following section outlines a simple theoretical model of targeting in a federal system, which helps motivate and interpret the subsequent empirical analysis. Section 3 describes the program. The measure of performance is discussed in section 4, while section 5 presents the overall results. The inter-provincial differences in performance are studied in section 6, while section 7 discusses some implications of the results. Section 8 concludes.

## 2. Are poor provinces worse at reaching their poor?

Federal anti-poverty programs often target poor provinces, in the hope of reaching poor areas within them. But could it be that the governments of poorer provinces are less effective at reaching their poor? And if so, how does that affect the case for targeting poor provinces?

Consider a federal system comprising many provincial governments and one central government.<sup>6</sup> The center wants to reduce poverty nationally, but it must rely on the federal system to channel resources to the poor. Why might some provincial governments give greater emphasis to targeting the poor than others? Differences in how much is received from the center are part of the answer; extra resources can no doubt buy more effort at targeting. Another factor is how poor the province is on average. If the poor are already receiving more than the non-poor, then a province with a higher poverty rate will have a harder time improving its targeting while keeping within its budget constraint. Poor provinces will be less able to afford targeting their poorest areas. Against this effect, poor provinces may well be able to attract more money from the center, so as to improve targeting within the province. This section formalizes this argument, which will help motivate and interpret the subsequent empirical analysis.

There are “poor” and “non-poor” people within each province, and public spending is to be allocated between them. The provincial government attributes a net benefit  $B_p(T_p)$  to its spending on a poor person  $T_p$ , and  $B_n(T_n)$  to its spending  $T_n$  on the non-poor. Various interpretations of the  $B_i$  functions are possible; for example, they could be thought of as expected votes in an election, or as normative “social preferences”. They can be taken to subsume other exogenous variables, and interpreted as expected values over the distribution of any random

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<sup>6</sup> An alternative interpretation is multiple national governments and one international multilateral aid donor, such as the World Bank. Multiple donors would complicate the analysis, however.

variables influencing the benefits from making transfers to a given group. I assume that  $B_i(T_i)$  is smoothly increasing and strictly concave for  $i=p,n$ . A proportion  $N_p$  of the population is poor.

The provincial government chooses  $T_p$  and  $T_n$  to maximize total benefit:

$$N_p B_p(T_p) + (1-N_p)B_n(T_n) \quad (1)$$

subject to its budget constraint:

$$N_p T_p + (1-N_p)T_n = T \quad (2)$$

Let the optimal allocation to group  $i$  be  $T_i(N_p, T)$ , which equates marginal benefits across the two groups,  $B_p'(T_p) = B_n'(T_n)$  (as well as satisfying equation (2)).<sup>7</sup>

How will differences in the poverty rate influence the spending decisions of provincial governments? On letting  $T'_{ix}$  denote the partial derivative of  $T_i$  with respect to  $x$ , it is readily verified that:

$$T'_{pN} = (T_n - T_p)T'_{pT} \quad (3.1)$$

$$T'_{nN} = (T_n - T_p)T'_{nT} \quad (3.2)$$

where

$$T'_{pT} = B_n''(T_n) J^{-1} > 0 \quad (4.1)$$

$$T'_{nT} = B_p''(T_p) J^{-1} > 0 \quad (4.2)$$

and

$$J \equiv N_p B_n''(T_n) + (1-N_p)B_p''(T_p) < 0 \quad (5)$$

<sup>7</sup> Note that when the  $B_i$  functions depend explicitly on a vector of exogenous variables these will then (in general) appear in the solution functions  $T_i$ . The empirical work will introduce other influences on poor-area targeting by the provinces, but they are ignored for now.

Thus  $T'_{pN} > 0$  if and only if  $T_n > T_p$ , and similarly for  $T'_{nN}$ . Amongst provinces which are targeting the poor ( $T_p > T_n$ ), the amount received by the poor will fall as the poverty rate rises.

How will the poverty rate influence the extent of pro-poor targeting? A key factor is the shape of the provincial government's social preferences. Here I assume that provincial targeting behaves as a "normal good", meaning that a higher allocation to a province by the center will improve the province's targeting performance as measured by  $T_p - T_n$ . Then  $T'_{pT} - T'_{nT} = (B_n''(T_n) - B_p''(T_p))J^{-1} > 0$ . The effect of differences in  $N_p$  on the extent of targeting is given by:

$$T'_{pN} - T'_{nN} = (T_n - T_p)(T'_{pT} - T'_{nT}) \quad (6)$$

It can be seen that  $T'_{pN} - T'_{nN}$  has the same sign as  $T_n - T_p$  when a higher budget allocation to a province improves its targeting performance.

One can summarize these results as follows:

*Proposition 1: If the poor are already receiving more than the non-poor and targeting at province level is a "normal good", then at any given budget allocation from the center, the extent of pro-poor targeting by the provincial government—measured by the absolute difference between the allocation to the poor and that to the non-poor—as well as the absolute amount received by the poor, will be lower the higher the poverty rate in the province.*

How then should a central government allocate its budget when aiming to reduce poverty nationally? In particular, should it allocate more to poorer provinces? To sharpen the analysis, I assume that the center's sole objective is to maximize the amount received by the poor, irrespective of which province they live in.

In the absence of a federal system, the center would target the poor directly, and it could then achieve perfect targeting in this model.<sup>8</sup> Provincial boundaries would then be irrelevant to the outcomes; there will be no horizontal inequality, in that equally poor people will receive equal allocations. However, in a federal system, the center's choices must be consistent with the choices made by the provincial governments, conditional on the center's actions.

Decentralization within a federal system thus entails an incentive compatibility constraint on the center's allocation problem. How then should provincial differences in average poverty rates influence the center?

The center maximizes the (population-weighted) sum of  $T_p(N_p, T)N_p$  over all provinces, subject to a national budget constraint.<sup>9</sup> I assume that  $T_p(N_p, T)$  is concave in  $T$ . This is not implied by the assumptions made so far, but it will hold in special cases. For example, it will hold if  $B_p'''(T_p) < 0$  and  $B_n'''(T_n) = 0$ —a special case I will return to. Concavity in  $T$  assures that there is an interior solution to the center's optimal allocation, equating  $T_p T(N_p, T)N_p$  across all provinces. Without this restriction, some provinces will receive nothing from the center; the following analysis can then be taken to apply to the remaining provinces.

The optimal allocation to a province is implicitly a function of the province's poverty rate. A sufficient condition for the center's allocation to be increasing in  $N_p$  is that  $T'_{pT}$  is non-

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<sup>8</sup> More general formulations would allow for other information and incentive constraints on targeting, but these can be ignored for the present purposes.

<sup>9</sup> An argument often made in favor of decentralized poverty programs is that the provinces may be better informed about poverty locally than is the center. This can be readily incorporated, without changing the argument to follow in any essential way, by postulating that  $T_p$  is also a function of some latent random variable unobserved by the center but with known distribution. The center's problem is then to maximize the (population-weighted) sum over all provinces of the expected value of  $T_p N_p$ , the expectation being formed over the distribution of the latent variable.

decreasing in  $N_p$  (or, equivalently, that  $T'_{pN}$  is non-decreasing in  $T$ ). This can hold under the same conditions as in Proposition 1. Thus we have:

*Proposition 2 : A central government aiming to reduce poverty nationally should target poor provinces—even when they are less effective at discriminating in favor of their own poor—if its budget allocation and the provincial poverty rate have cooperant effects on the propensity of a province to spend on the poor.*

While the center may be justified in targeting poor provinces even when they are less effective at reaching their poor, this need not yield the maximum reduction in poverty nationally. Suppose that a higher allocation to a province reduces the marginal impact on transfers to the poor of a higher provincial poverty rate (a more negative marginal impact when the province is already targeting the poor). Then it can be optimal for the center to give a higher allocation to less poor provinces if it is to maximize the gain to the poor nationally.

Negativity of  $T'_{pTN}$  cannot be ruled out. Consider again the case in which  $B_p''' < 0$  and  $B_n''' = 0$ . Then it is readily verified that:

$$T'_{pTN} = -B_n''(B_n'' - B_p'') J^{-2} < 0 \quad (7)$$

(continuing to assume that pro-poor targeting is a normal good). If this is sufficiently negative (the elasticity of  $T_{pT}$  to  $N_p$  is less than -1) then the central allocation which equates  $T_{pT}(N_p, T)N_p$  across all provinces will entail a higher allocation to provinces with lower values of  $N_p$ . So one cannot easily rule out the possibility of a “perverse” case in which the targeting behavior of the provincial governments entails that the best strategy for a central government aiming to fight poverty nationally is to target less poor provinces.

Notice that there are two effects of a higher poverty rate at the provincial level on performance at reaching the poor within the province. Under the condition in Proposition 2, these two effects will work in opposite directions. Poorer provinces will perform less well at reaching their poor at any given budgetary allocation from the center, but they will also attract a higher allocation a central government aiming to reduce poverty nationally, and this will improve their performance at targeting. Later we will see whether the data on the Argentinean program are consistent with this model, and determine which of these two effects dominates.

### **3. Argentina's Trabajar Program**

With financial and technical support from the World Bank, the Government of Argentina introduced the "Trabajar 2" program in May 1997. The program aims to reduce poverty in two ways. Firstly, by providing short-term work at relatively low wages, the program aims to self-select unemployed workers from poor families. Secondly, the scheme tries to locate projects in poor areas. The projects are proposed by local governmental and non-governmental organizations who must cover the non-wage costs. The projects have to be viable by a range of criteria, and are given priority according to ex ante assessments of how well targeted they are to poor areas, what benefits they are likely to bring to the local community, and how much the area has already received from the program. The workers cannot be receiving unemployment benefits or be participating in any other employment or training program. It appears unlikely that the program would affect residential location, though of course workers may commute.

As the name suggests, Trabajar 2 replaced a prior program, Trabajar 1. The new program entailed a substantially greater level of spending; within five months of commencement, Trabajar 2 had disbursed more than double the spending on Trabajar 1 over the previous year, involving

an expenditure by the center of over \$100 million, with 250,000 workers participating. In addition to a greater overall budget, a number of features of Trabajar were changed under Trabajar 2. The poverty focus of the program was strengthened by putting greater emphasis on reaching poor areas. Poverty measures were included in the center's budget allocation rules and in selection criteria for projects (based on a points system which gave higher priority to projects proposed by poor areas). The poverty focus was also made clearer to provincial administrators.

The reforms entailed some sizable changes in the center's budget allocation across provinces. Figure 1 plots spending per capita on the program by province under Trabajar 2 (May-September 1997) against that under Trabajar 1. While there is a positive correlation (of 0.58, significant at the 5% level), there were some large changes in the provincial allocation. Later we will see how effective these were in improving the program's ability to reach poor areas.

The benefits to the poor from this program will depend in part on the ability of local communities to propose and cofinance viable projects. Better off areas will undoubtedly have a comparative advantage in this respect and so be the first to gain. Poorer provinces tend to be more severely constrained in cofinancing projects.<sup>10</sup> Thus the germ of a possible problem in reaching poor areas lies at the heart of the program's design, whereby the center only provides the labor share of the cost of sub-projects, leaving the cofinancing up to local areas. To some extent the design features of Trabajar 2, including preferential treatment of sub-project proposals from poor areas, will help get around this problem. We will see how well they do below.

The rest of this paper tries to assess how well Trabajar 2 performed in reaching poor areas, whether this improved over Trabajar 1, and why. The empirical work draws on the

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<sup>10</sup> There is a correlation of -0.73 between the share of total sub-project costs which were cofinanced and the provincial poverty rate (using the measure described below).

program's information system set up by the Ministry of Labor in the Government of Argentina.

Data were available for the first six months of the program's operation, May to October 1997.

#### **4. Measuring performance in reaching poor areas**

There is a literature on measuring the performance of provincial or local governments in delivering public services based on stochastic frontier models, assuming a common set of cost-function parameters across all provinces (see, for example, Deller, 1992, and Davis and Hayes, 1993). Here we face a different problem: the parameters vary across provinces, and it is that variation which we want to identify and explain.

The spatial variances at the level below the province can be exploited for this purpose. The geographic level below the province in Argentina is the "department" ("partido" in Buenos Aires), of which there are slightly over 500 nationally. A poverty measure is available for assessing performance in reaching poor departments, namely the proportion of households with "unmet basic needs" (*UBN*), based on the 1991 census. This is a composite index of deprivation with respect to indicators of residential crowding, sanitation facilities, housing quality, education attainments (of adults), school enrollments (of children), employment and dependency. Since it is based on the census, the *UBN* index covers the whole population, and so is representative at a low level of geographic aggregation. The index is somewhat out of date (5-6 years prior to the Trabajar program), however, and the composition and weighting of the component indicators is not beyond question. Nonetheless, the *UBN* index is the best information available for the present purpose. It is also the main information used by provincial offices in setting priorities for Trabajar sub-projects, although it can be expected that most provinces will also have access to miscellaneous ad hoc indicators of poverty, which may well allow the provincial Trabajar office

to improve targeting relative to the *UBN* data. Clearly, any assessment of targeting performance with respect to the *UBN* index by department must allow for an error term reflecting unobserved variables independent of the *UBN* index.

To assess performance one can compare the Trabajar allocation per capita with the percentage of the population with unmet basic needs. I shall measure targeting performance by the expected difference in spending between an area in which there are no households with unmet basic needs and one in which every household has unmet basic needs. I call this the “poor-area targeting (*PAT*) coefficient”. The expectation is formed over the distribution of a zero-mean error term embodying other determinants of spending in a given area and any measurement error. If there is no difference in spending per capita between “poor” and “non-poor” areas then the *PAT* coefficient is zero. If it is negative, then the program favors non-poor areas; if positive, it favors poor areas. The higher the *PAT* coefficient, the more spending favors poor areas.<sup>11</sup>

To estimate the *PAT* coefficient one can run a linear regression of Trabajar spending per capita against the poverty indicator. There are in fact three *PAT* coefficients of interest. On regressing the Trabajar allocation across provinces on the provincial poverty measures, we first have the inter-provincial coefficient, *PAT<sup>P</sup>*, defined implicitly by the regression:

$$TPC_j - TPC = PAT^P(UBN_j - UBN) + residual_j \quad (j=1,\dots,M) \quad (8)$$

where *TPC<sub>j</sub>* is the mean allocation to the *j*'th province, *TPC* is the overall (national) mean, while *UBN<sub>j</sub>* is the unmet basic needs indicator for the *j*'th province, with national mean *UBN*. A zero

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<sup>11</sup> The *PAT* coefficient is interpretable as a measure of “absolute progressivity”, in that the absolute amount received is higher for poorer areas (as distinct from the more common definition of progressivity in which only the ratio of amount received to welfare level is higher for the poor). Absolute progressivity

mean residual is included to allow for other determinants of the Trabajar allocation and measurement error. Equation (8) also allows positive Trabajar spending when  $UBN=0$ . This is done by expressing  $TPC$  and  $UBN$  as deviations from their respective province means.

Secondly, we can define the inter-departmental coefficient,  $PAT^D$ , by the following regression across all departments, irrespective of their province:

$$TPC_{ij} - TPC_j = PAT^D(UBN_{ij} - UBN) + residual_{ij} \quad (i=1, \dots, N_j; j=1, \dots, M) \quad (9)$$

where  $TPC_{ij}$  is the Trabajar allocation in the  $i$ 'th department of the  $j$ 'th province, and  $UBN_{ij}$  is the percentage of the population in the  $i$ 'th department of the  $j$ 'th province with unmet basic needs. Note that the regression in (9) is run on all  $\sum N_j$  departments, where  $j=1, \dots, M$ . Finally, for each province we have a province-specific  $PAT$  coefficient from the regression:

$$TPC_{ij} - TPC_j = PAT_j(UBN_{ij} - UBN_j) + residual_{ij} \quad (i=1, \dots, N_j) \quad (10)$$

where  $PAT_j$  is the poor-area targeting coefficient for the  $j$ 'th province.

Notice that the  $PAT$  coefficients are not unit free; the units are spending per person with unmet basic needs. Corresponding to equations (8)-(10), one can also define "relative  $PAT$  coefficients" by normalizing by the program spending per poor person. For example, the relative  $PAT$  coefficient for province  $j$  is  $PAT_j UBN_j / TPC_j$ . This is interpretable as the elasticity of program spending with respect to the poverty rate.

Equation (10) can be used to assess the extent of horizontal inequality, defined as the difference in expected program allocation between two departments with the same poverty

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is the more relevant concept in this context, given that it is more natural to think of an untargeted allocation (zero  $PAT$  coefficient) as one in which all areas get the same absolute amount in expectation.

measure. Let  $UBN^*$  denote a fixed reference value. Then, on setting  $UBN_{ij} = UBN^*$  in equation (10), the expected allocation from the center's budget will vary by province according to:

$$TPC_j^* = TPC_j + PAT_j(UBN^* - UBN_j) \quad (11)$$

(Notice that this is the expected value, so that it already averages out idiosyncratic differences.)

There is a mathematical relationship between these three  $PAT$  coefficients. The Appendix shows that the inter-departmental targeting coefficient,  $PAT^D$ , can be decomposed exactly into between-province and within-province components as:

$$\begin{array}{l} PAT^D = SS^P.PAT^P + \sum SS_j.PAT_j \\ \text{(total)} \quad \quad \quad \text{(between} \quad \quad \quad \text{(within} \\ \quad \quad \quad \quad \quad \text{provinces)} \quad \quad \quad \text{provinces)} \end{array} \quad (12)$$

where

$$SS^P \equiv \sum N_j(UBN_j - UBN)^2 / \sum \sum (UBN_{ij} - UBN_j)^2 \quad (13)$$

and (analogously)  $SS_j$  is  $j$ 's share of the sum of squared deviations from the national mean  $UBN$ . For this decomposition to be exact, however,  $PAT^P$ , must be obtained from an appropriately weighted regression (Appendix). Given that  $SS^P$  and the  $SS_j$ 's are the same for Trabajar 1 as Trabajar 2, we can also decompose the changes in  $PAT^D$  straightforwardly as:

$$\Delta PAT^D = SS^P \Delta PAT^P + \sum SS_j \Delta PAT_j \quad (14)$$

where  $\Delta$  denotes the difference between Trabajar 2 and Trabajar 1.

## 5. Overall performance in reaching poor areas

Let us first look at how the budget allocation between provinces changed with the program's reform and expansion. Under Trabajar 1, the *PAT*<sup>P</sup> coefficient was 0.15, and only significantly different from zero at the 8% level (t-ratio=1.86).<sup>12</sup> This changed dramatically in Trabajar 2. The inter-province *PAT* coefficient rose to 0.59, which is highly significant (t-ratio=6.37).<sup>13</sup> These are the ordinary (unweighted) *PAT* coefficients. On calculating the weighted coefficients (see Appendix), one finds that the inter-provincial *PAT* coefficient under Trabajar 1 was 0.25, significant at the 5% level (t=2.12), while the weighted *PAT* coefficient under the new program is 0.74, which is highly significant (t=4.85).

Clearly the reforms to the program greatly enhanced the extent to which it is targeted to provinces with high incidence of unmet basic needs. However, this is clearly easier for the center to control than is the allocation within provinces, which we turn to next.

Let us now ignore the differences between provinces, so as to assess whether the national program is reaching poor areas, and how this changed between Trabajar 1 and 2. Over all 510 departments, the *PAT* coefficient in Trabajar 1 was 0.41 (t-ratio=4.29). The coefficient is significantly different from zero at the 1% level. Trabajar 1 was targeted to poor areas, despite poor performance in reaching poor provinces. How did this change in Trabajar 2? The *PAT*

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<sup>12</sup> The residuals indicated heteroskedasticity and so the t-ratio reported is based on White standard errors, corrected for any general type of heteroskedasticity present in the data. This was a common feature of the estimated *PAT* coefficients so White standard errors are used throughout this paper.

<sup>13</sup> These calculations are based on actual disbursements. These differed somewhat from the planned disbursements, due to unexpected differences in demand for the program. If one allocates actual total disbursements in this period in proportion to the planned disbursements and repeats the above test one finds that the *PAT* coefficient is very similar, namely 0.52 (with a t-ratio of 9.26). The deviations from the planned disbursements resulted in a slight improvement in the targeting performance.

coefficient over all departments rose to 0.80 ( $t=10.33$ ). So there was an improvement in performance in reaching poor areas across the country as a whole.

How much of this improvement in poor-area targeting was due to the improved performance in targeting poor provinces? On calculating (13), one finds that the between-provinces component accounts for 28% of the total sum of squared deviations from the mean *UBN* index. Clearly then, reaching poor provinces alone cannot assure that poor departments will be reached. Using the decomposition in equation (12), one finds that 17% ( $=0.28 \times 0.25 / 0.41$ ) of the interdepartmental *PAT* coefficient of Trabajar 1 was attributable to the allocation between provinces; the rest was due to targeting within provinces. (Notice that this uses the weighted *PAT* coefficient, as required for the decomposition to be exact.) Under Trabajar 2, the share due to targeting provinces by the center rose to 26% ( $=0.28 \times 0.74 / 0.80$ ). There was an increase in the contribution of the center's efforts to target poor provinces to overall performance in reaching poor departments, though even so the bulk of the national interdepartmental *PAT* coefficient was due to intra-provincial targeting.

Turning to the decomposition of changes over time, we have seen that  $\Delta PAT^D=0.39$  (since the *PAT* coefficient across departments rose from 0.41 to 0.80), and that  $\Delta PAT^P=0.50$ , while  $SS^P=0.28$ . Thus (using equation 14) one finds that 0.14 (36%) of the improvement in targeting performance across departments nationally can be attributed to the center's success at better targeting poor provinces. The remaining two thirds of the gain was through better targeting of poor areas within provinces.

Notice that this is a comparison of the overall targeting performance across departments. Since the absolute level of spending is higher under Trabajar 2, the poorest department will also

be better off than under Trabajar 1 even without the improved targeting. Consider, for example, a department in which 42% of the population have unmet basic needs—one standard deviation above the national mean over all departments. Under Trabajar 1, this department would expect to receive \$16.10 per person, over one year. Under Trabajar 2, the same department would have received \$32.31 per person, over five months, a gain of about \$16 per person over Trabajar 1. Clearly then there was a large absolute gain to poor areas under Trabajar 2, although a share of this gain was attributable to the higher total outlays on the program by the center. With the Trabajar 2 mean allocation, but no improvement in targeting performance (i.e., assuming the *PAT* coefficient for Trabajar 2 was the same as that for Trabajar 1), one would have expected a department with 42% unmet basic needs to have received \$26.11. So about \$6 of the gain is due to improved targeting, and \$10 due to higher average outlay. (\$10 being the difference between the overall mean spending under Trabajar 2 of \$19.72 and that under Trabajar 1 of \$9.70.) To give a second example, at a *UBN* rate of 58% (two standard deviations above the mean, and the poorest 5% of departments) the gain is about \$23, of which \$13 is due to the improved targeting. The higher the department's poverty rate the higher its gain from expansion and reform of the program, and the higher the share due to the improved targeting.

## **6. Inter-provincial differences in targeting performance**

We have seen that although the allocation across provinces improved greatly, it remains that two thirds of the gain in the program's overall performance in reaching poor areas was from better targeting within provinces. The provinces differed greatly in their success at reaching poor

areas. To assess changes in the intra-province spending, Table 1 gives the *PAT* coefficient for each province. Figure 2 plots the coefficients for Trabajar 2 against those for Trabajar 1.

Under Trabajar 1, the province with the highest *PAT* coefficient was Salta, with a value of 1.06. The province of Jujuy was close behind, followed by San Juan, San Luis, Cordoba, and Mendoza. After these six provinces, targeting performance drops sharply. Entre Rios, Santa Fe, and Formosa have significantly positive but low *PAT* coefficients. Twelve provinces had *PAT* coefficients which were not significantly different from zero under Trabajar 1. Only one province had a *PAT* coefficient which was significantly less than zero, namely La Pampa, although the coefficient there was still small (-0.09).

The number of provinces which were reaching poor areas rose slightly with the expansion and redesign of the program under Trabajar 2. While the *PAT* coefficient was significantly positive for nine provinces in Trabajar 1, this rose to 11 provinces under Trabajar 2. There were noticeable improvements in performance for 12 provinces (Table 1); nine of these were provinces which had a significantly positive *PAT* coefficient in Trabajar 1. There was also considerable re-ranking. While Salta had the highest *PAT* in Trabajar 1, it did not improve its performance in Trabajar 2, and was overtaken by five provinces (Cordoba, San Luis, Rio Negro, Tucuman and San Juan). Substantial improvements were made by Rio Negro, San Luis, Tucuman, Santiago Del Estero, and Santa Fe. While achieving less substantial gains in outreach to poor areas, La Pampa succeeded in switching from significant targeting away from poor areas under Trabajar 1 to significantly pro-poor targeting under Trabajar 2.

What explains these differences across provinces in their success at reaching poor areas? There is no simple correlation with the provincial poverty rates (the correlation coefficient of the *PAT* coefficient for Trabajar 2 with the *UBN* rate is -0.07; for Trabajar 1 it is 0.27.) However,

there are clearly other factors to consider. The model in section 2 points to the role played by the center's budget allocation to the province, as well as how poor the province is on average.

Motivated by that model, I shall consider the effect of two variables:

(i) The central government's allocation to the province. We saw in section 2 that it is not clear on a priori grounds what the direction of the effect of higher average spending by the center will be on a province's performance in targeting poor areas. At low levels of spending, priority may be given to less poor areas, which are presumably better positioned to propose and cofinance projects. Then poor areas will only be reached at higher levels of spending. Or possibly the provinces give highest initial weight to the poorest areas, so that poor-area targeting deteriorates as spending increases.

(ii) How poor the province is on average. The model in section 2 identified conditions under which provinces with a higher poverty rate will be less effective in discriminating in favor of their poor areas at a given budget level. In particular, if a higher allocation from the center improves targeting performance, and this is already pro-poor, then the higher the province's overall poverty rate, the worse performance will be at targeting the poor (Proposition 1).

However (to simplify the analysis), the model in section 2 treated provinces as homogeneous in all other respects. This is not of course realistic. The ability of a province to reach poor areas will be constrained to some extent by factors which are not easily changed with a new federal program. The capacity of poor areas to mount viable projects, and get them approved, will vary from province to province, as will the motivation and efforts of the local program staff. Some provincial governments will be politically more disposed to helping the poor and/or keeping the allegiance of past beneficiaries of similar public programs. To allow for heterogeneity in provincial social preferences, I introduce two more variables:

(i) Past performance at targeting poor areas. I will use the *PAT* coefficient for Trabajar 1, which I interpret as a proxy for (otherwise omitted) attributes of the provincial government's social preferences.

(ii) Prior participation in the program. People who have already participated in similar programs will no doubt be keen to get continuing work on the new program. And they may well be a more vocal group than those who have not yet benefited from the program. If provinces tend to favor workers already participating in Trabajar 1 or similar employment programs, and the lower levels of spending under past programs tended to favor the less poor areas, then this may well constrain the province's ability to reach poor areas under Trabajar 2. By this reasoning, higher proportions of continuing workers (i.e., Trabajar 2 workers who were also in Trabajar 1 or similar programs) will be associated with worse performance in reaching poor areas.

Table 2, column (1), gives regressions of the *PAT* coefficients by province for Trabajar 2 against these four variables: the level of spending per capita under Trabajar 2, the average proportion of the province's population with unmet basic needs, the corresponding *PAT* coefficient under Trabajar 1, and the proportion of Trabajar 2 workers who had also participated in Trabajar 1.

The four variables have a significant impact on program performance in reaching poor areas, and can explain about three-quarters of the variance in performance across provinces. (All four coefficients are significant at better than the 1% level.) Higher levels of spending by the center resulted in improved performance, suggesting that less poor areas tend to be favored first. Better past performance at reaching poor areas tends to be associated with better current performance. A higher commitment to keeping Trabajar 1 workers employed constrains ability to

reach poor areas. Controlling for these variables, higher provincial poverty rates were associated with worse performance; Figure 3 plots the relationship, setting other variables at their means.

I considered five variations on the OLS specification in Table 2:

(i) The regression coefficient on the measure of poor area targeting under the old program is close to one. Given the many change in the program's design, it is questionable whether this variable should be interpreted as a lagged dependent variable in the strict sense of that term.

Nonetheless, Table 2, column (2), also gives the restricted form in which the coefficient is set to one, and the dependent variable becomes the change in the *PAT* coefficient between Trabajar 1 and Trabajar 2. Other coefficients are affected little.

(ii) I tested for an interaction effect between the *UBN* indicator and the Trabajar allocation by the center; a sufficiently strong negative cross-effect between these two variables would mean that the center would do better at reaching poor areas if it were to target less poor provinces (section 2). However, this "perverse" outcome is not consistent with the data. The interaction effect was positive, but highly insignificant (a t-ratio of 0.20). The condition in Proposition 2 is consistent with the data.

(iii) I tested Trabajar 1 spending as an extra regressor in the OLS estimates in Table 2. It was insignificant in both the levels and difference models (t-ratios were 1.00 and 1.07 respectively), and other coefficients and standard errors were similar.

(iv) I considered the possibility that spending under the program could be allocated by the center in response to indicators of provincial ability at reaching poor areas. This is likely to bias the estimates in columns (1) and (2) of Table 2. To address this concern, Table 2 also gives an instrumental variables (IV) estimate of the model in which the average level of Trabajar 2 spending is treated as endogenous, using Trabajar 1 spending as the instrumental variable. The

equation for Trabajar 2 spending (estimated jointly with the second regression in Table 2) entailed regressing the log of spending per capita on the log of the proportion of the province population with unmet basic needs (a regression coefficient of 0.808, with a t-ratio of 4.80) and the log of Trabajar 1 spending per capita (a regression coefficient of 0.456, with a t-ratio of 6.39). The IV regression for the change in the PAT coefficient is also given in column (4). The IV estimator gives a higher coefficient on the program budget, and that on the poverty measure is more negative. Otherwise the results are similar to the OLS estimates.

(v) Differences between provinces in the PAT coefficients will reflect differences in the absolute levels of both poverty and program spending. It is of interest to see how the regressions in Table 2 alter when one uses instead the relative PAT coefficients, obtained by normalizing the provincial PAT coefficients by Trabajar spending per poor person (as discussed in section 4). The results are in Table 3. The coefficient on the (relative) PAT coefficient of Trabajar 1 is now significantly different from unity, and so I do not report the corresponding regressions for the difference in PAT coefficients. However, otherwise the results are similar to Table 2.

## **7. Implications**

The results of the last section indicate that provinces which received a higher allocation of program resources from the center tended to be the ones which are more effective in reaching poor areas. The results also suggest that the incentive to reach poor areas within the province was duller for a poorer province. In terms of the model in section 2, these findings suggest that provincial demand for targeting poor areas is a normal good (in that higher total allocations to a province increase the *PAT* coefficient). The finding that provinces which are poorer on average tend to target poor areas less well is then consistent with pro-poor targeting overall (section 2).

Given that the demand for targeting is a normal good, poorer provinces will have a harder time keeping within their budget constraint if they make any greater effort at reaching their poor areas.

We also saw in section 5 that poorer provinces tended to obtain higher budget allocations from the center. This enhances their ability to reach poor areas. So, consistent with the theoretical conditions identified in section 2, there are two effects of living in a poorer province which work in opposite directions: the direct effect holding spending constant, and an indirect effect via higher levels of spending. The empirical results above suggest that the direct effect dominates. The estimate of the joint model of the *PAT* coefficient in the previous section implies that the total effect of a higher incidence of unmet basic needs on the *PAT* coefficient is -1.27 and is significantly different from zero. (A Wald test gave a Chi-square statistic of 22.1, which is significant at better than the 0.01% level.) So on balance, poorer provinces tend to be less effective in discriminating in favor of poor areas within the province.

Depending on how the center allocates resources across provinces, this may yield horizontal inequalities between provinces in how much a poor area with given poverty incidence receives from the program. The extent of such horizontal inequality provides an indication of how much the federal system constrains the center from achieving perfect targeting. We have found that the average allocation to a province under Trabajar 2 responded positively to the province-level poverty indicator, but that targeting within the province responded negatively. On balance then, did higher poverty incidence in a province entail a higher allocation to poor areas with given poverty incidence?

To address this question, consider a reference poor area with unmet basic needs *UBN\**, fixed across all provinces. Figure 4 plots the expected value of the program spending, *TPC\** as

implied by equation (11), for all provinces ranked by their *UBN* index. I give the results for three values of *UBN\**, namely 20%, 30% and 40%.<sup>14</sup>

Four observations can be made from Figure 4. Firstly, there is considerable horizontal inequality, as indicated by the large differences in the expected program allocations to areas with the same poverty measure. For example, a department in which 40% of the people have unmet basic needs (about the fifth poorest percentile) can expect to receive anything from zero to five times the national mean allocation, depending on what province the department belongs. Secondly, the absolute magnitude of the differences tends to be larger the poorer the reference area; the standard deviations (coefficients of variation) are 4.8 (42%), 8.4 (47%), and 14.0 (58%) for *UBN\**s of 20%, 30% and 40% respectively. Thirdly, in almost all provinces, the poorer the area the higher the program allocation. And finally, there is no correlation with how poor the province is on average; the correlation coefficients with the province mean *UBN* are 0.11, 0.01 and -0.03 for *UBN\**s of 20%, 30% and 40% respectively.

So the center's allocations under the reformed program were able to eliminate (in expectation) horizontal inequality in the treatment of poor areas according to how poor their province is on average. This is consistent with finding that targeting performance tends to be worse in poorer provinces. As noted above, the *PAT* coefficient tends to be lower in provinces with higher average *UBN*, even factoring in the effect on the center's allocation of being a poorer province. However, equation (11), and the results in Figure 3, are giving us the expected total amounts per capita received by a department with a given poverty rate. This reflects the average allocation from the center, as well as targeting performance of the province, given its poverty

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<sup>14</sup> The (unweighted) mean *UBN* is 22.5% with standard deviation of 7.7%. I also tried *UBN\**s of 15% and 50%; these followed the same pattern, but are omitted to simplify the figure.

rate. Worse targeting in poor provinces is compensated for by higher average outlays by the center.

However, considerable horizontal inequality remained, reflecting the influence of other provincial characteristics. And it is clear that the central allocation did not provide adequate incentive for better provincial performance in reaching poor areas. Indeed, the comparison of the IV estimator with OLS one in Table 2 does not suggest that the center's budget allocation across provinces provided any positive incentive for better intra-provincial targeting. For if better performance at targeting poor areas was rewarded by a higher budget allocation, then one would expect (*ceteris paribus*) to see a decrease in the regression coefficient on the Trabajar budget when one switched from OLS to the IV estimator; instead we see the opposite.

This holds an obvious implication for achieving better outcomes in the future, within the incentive compatibility constraints of the federal system. While (under the reformed program) the center's allocation is responding strongly to differences in provincial poverty rates, it also needs to reward provincial success at reaching poor areas. And it appears that this incentive will need to be even stronger in poorer provinces.

## **8. Conclusions**

The paper has studied the performance of a federal anti-poverty program in reaching poor areas, taking the reactions of lower levels of government into account. Under certain conditions (summarized in Proposition 1), the governments of poorer provinces will be less successful in reaching their own poor, both absolutely and relative to their spending on the non-poor. Nonetheless (under the same conditions), higher allocations from the center will improve performance in reaching the poor, and it can still be optimal for a central government to target

poor provinces when aiming to reduce poverty nationally (Proposition 2). Motivated by a theoretical model of targeting in a federal system, the paper has investigated these issues empirically, by means of a case study of one specific program in Argentina.

A measure of governmental performance at reaching poor areas has been proposed, namely the regression coefficient of the amount received on a welfare indicator. The national regression coefficient across all local government areas (irrespective of their province) can be decomposed to allow an assessment of the contribution of the center's targeting of provinces versus the efforts of the provinces themselves. The application here has been to poor area targeting, where one level of government exists between the center and the poor areas. However, the approach can be extended to allow other applications. For example, there may be multiple intermediate levels. Or the target population may not be poor areas but poor people—so one models success at reaching poor people by different local government areas.

The paper has studied performance at reaching poor areas before and after reforms to the Argentinean program. A substantial reallocation of program resources across Argentina's provinces occurred when the Trabajar 1 program was replaced by Trabajar 2, entailing higher total spending and program design changes to encourage targeting to poor areas. There was a marked improvement in the program's success at reaching poor provinces. Performance in reaching poor areas within provinces also improved for half of the provinces. Overall performance in reaching poor areas (irrespective of their province) improved nationally. About one third of the gain in the program's ability to reach poor areas was due to its greater ability to reach poor provinces, the rest being due to better targeting of poor areas within provinces.

The provinces differed greatly in their success at reaching poor areas. History mattered. The differences in performance after the reforms partly reflected earlier differences under the old program. And efforts to keep workers previously employed on the old program in Trabajar jobs tended to constrain performance at reaching poor areas. Controlling for these factors, poorer provinces were less successful in targeting their poor areas, at any given budget allocation from the center. At the same time, a higher provincial poverty rate attracted higher levels of spending from the center, which tended to result in a more pro-poor spending within provinces. But even after factoring in this effect, poorer provinces were less successful at discriminating in favor of their poor areas.

Higher spending on poor provinces by the center helped offset their worse performance at reaching poor areas. On balance, there was no difference (in expectation) between how much two equally poor areas—one in a poor province, the other in a rich one—could expect to receive from the program. Nonetheless, given the other influences on targeting performance within provinces, decentralized program placement generated considerable horizontal inequality in how much was received by equally poor communities in different provinces.

While these results illustrate the limitations of targeting poor provinces as a means of reaching poor areas within a federal system, they also point to ways in which better outcomes might be achieved in the future. The center clearly needs to provide stronger incentives for pro-poor targeting by provincial governments. The allocation to a province should depend not only on how poor the province is, but how successful it is at discriminating in favor of poor areas. And these results suggest that even stronger incentives will be needed to improve the performance of poorer provinces.

The results are suggestive in other respects, beyond the issues directly addressed in this paper. The finding that poorer provinces are less successful at targeting their poor areas suggests that economic growth will help reduce disparities within provinces, by enhancing the capacity of poor provincial governments in reaching their poor areas. By similar reasoning, persistently poor areas will tend to be associated with persistently poor provinces.

It is also tempting to draw an analogy with the problem faced by international aid donors aiming to reduce poverty globally, recognizing that their success will depend in part on the policies of recipient countries. Similar reasoning suggests that the governments of poorer countries will have a harder time targeting their poor, which will help perpetuate poverty in the absence of compensatory aid flows. The latter may also need to incorporate incentives for better performance. Convincing empirical work to test these effects in an international setting will no doubt present new challenges for future research.

## Appendix: Decomposing the measure of poor-area targeting

The measure of inter-departmental targeting at the national level,  $PAT^D$ , is simply the regression coefficient of program spending per capita against the poverty measure, using the department as the unit of observation; this can be written as:

$$PAT^D = \frac{\sum \sum (TPC_{ij} - TPC_j)(UBN_{ij} - UBN)}{\sum \sum (UBN_{ij} - UBN)^2} \quad (A1)$$

The numerator can be re-written as:

$$\sum \sum [(TPC_{ij} - TPC_j) + (TPC_j - TPC)] [(UBN_{ij} - UBN_j) + (UBN_j - UBN)] \quad (A2)$$

On expanding this expression one obtains:

$$\sum (TPC_j - TPC)(UBN_j - UBN)N_j + \sum \sum (TPC_{ij} - TPC_j)(UBN_{ij} - UBN_j) \quad (A3)$$

noting that the other terms in the expansion vanish given that  $UBN_j = \sum_i UBN_{ij}/N_j$  and similarly for  $TPC_j$ . Thus one can re-write the inter-departmental  $PAT$  coefficient as equation (9) in the text, where  $SS^P$  is defined by equation (13) and

$$PAT^P = \frac{\sum N_j (TPC_j - TPC)(UBN_j - UBN)}{\sum N_j (UBN_j - UBN)^2} \quad (A4.1)$$

$$SS_j = \frac{\sum_i (UBN_{ij} - UBN_j)^2}{\sum \sum (UBN_{ij} - UBN_j)^2} \quad (A4.2)$$

$$PAT_j = \frac{\sum_i (TPC_{ij} - TPC_j)(UBN_{ij} - UBN_j)}{\sum_i (UBN_{ij} - UBN_j)^2} \quad (A4.3)$$

Notice that (A4.1) requires that  $PAT^P$  be estimated from the weighted regression:

$$N_j^{1/2} (TPC_j - TPC) = PAT^P N_j^{1/2} (UBN_j - UBN) + residual_j \quad (A5)$$

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**Table 1:**  
**Poor Area Targeting Performance by Province**

Province	Trabajar 1 1996-97	Trabajar 2 May-Sept., 1997	Is Trabajar 2 targeted to poor areas?	An improve- met since Trabajar 1?
Buenos Aires [134]	-0.044 (-1.59)	-0.129 ** (-1.73)	No	No, and worsening
Catamarca [16]	0.338 (0.71)	0.332 (1.14)	No	No
Chaco [25]	0.279 (1.21)	0.343 (0.93)	No	No
Chubut [15]	-0.085 (-0.04)	0.382 (0.96)	No	Yes
Cordoba [26]	0.763 * (3.97)	1.996 * (6.38)	Yes	Yes
Corrientes [25]	-0.030 (-1.60)	0.656 ** (1.67)	Yes	Yes
Entre Rios [16]	0.192 * (2.33)	0.270 (1.04)	No	No
Formosa [9]	0.165 * (2.22)	0.027 (0.07)	No	No, and worsening
Jujuy [16]	0.936 * (3.27)	0.987 * (2.23)	Yes	No
La Pampa [22]	-0.092 * (-2.17)	0.275 ** (1.87)	Yes	Yes
La Rioja [18]	-0.034 (-0.11)	-0.191 (-0.40)	No	No
Mendoza [18]	0.492 * (2.71)	0.664 * (3.59)	Yes	Yes
Misiones [18]	0.007 (0.06)	-0.204 (1.43)	No	No

Table 1, continued.

Neuquen [16]	0.022 (0.08)	0.023 (0.06)	No	No
Rio Negro [13]	0.243 (1.65)	1.449 (1.73)	No	Yes
Salta [23]	1.056 * (2.29)	1.057 ** (1.86)	Yes	No
San Juan [19]	0.908 * (3.27)	1.209 * (3.13)	Yes	Yes
San Luis [9]	0.888 * (3.01)	1.801 * (4.02)	Yes	Yes
Santa Cruz [7]	-1.153 (-1.14)	0.012 (0.04)	No	Yes
Santa Fe [19]	0.169 * (2.90)	0.690 ** (1.84)	Yes	Yes
Santiago Del Estero [27]	0.107 (0.89)	0.837 * (3.13)	Yes	Yes
Tucuman [17]	0.269 (1.63)	1.308 * (4.56)	Yes	Yes

Note: The table gives the regression coefficient of Trabajar spending per capita on the percentage of the population with unmet basic needs for each province, using the department as the unit of observation. (Tierra Del Fuego is excluded because there are only two departments.) Numbers in [.] are the numbers of departments in each province. The numbers in (.) below each coefficient are the t-ratios (based on White standard errors). \* indicates that the regression coefficient is significantly different from zero at 5% level; \*\* indicates that it is significant at the 10% level. The third and fourth columns are the author's judgment, based solely on the information in the first and second columns.

**Table 2:**  
**Explaining Inter-Provincial Differences in Performance at Targeting Poor Areas**

	(1) Trabajajar 2 spending is exogenous	(2) $\Delta PAT$	(3) Trabajajar 2 spending is endogenous	(4) $\Delta PAT$
	<i>PAT</i>	$\Delta PAT$	<i>PAT</i>	$\Delta PAT$
Intercept	4.576 (4.67)	4.618 (4.99)	4.840 (4.63)	4.932 (4.76)
Trabajajar 2 spending per capita (log)	0.560 (5.21)	0.554 (5.91)	0.673 (3.69)	0.683 (3.49)
Percent of population with unmet basic needs (log)	-1.577 (4.85)	-1.592 (5.20)	-1.735 (4.59)	-1.777 (4.52)
Poor area targeting performance of Trabajajar 1	0.941 (6.80)	n.a.	0.932 (6.57)	n.a.
Prior participation in Trabajajar 1 or other employment programs	-0.024 (3.99)	-0.023 (4.33)	-0.025 (3.47)	-0.025 (3.49)
$R^2$	0.731	0.525	0.726	0.513
Mean dependent variable	0.627	0.382	0.627	0.381
Standard error of regression	0.369	0.360	0.372	0.364
F-statistic	11.578	6.628	11.161	6.211

Note: The regressions in columns (1) and (2) use ordinary least squares. Columns (3) and (4) uses the instrumental variables estimator in which spending under Trabajajar 2 is treated as endogenous, with spending under Trabajajar 1 as the instrumental variable. The dependent variable for columns (1) and (3) is the *PAT* coefficient for Trabajajar 2 by province, while for (2) and (4) it is the difference between the *PAT* coefficients for Trabajajar 2 and Trabajajar 1. There are 22 provinces. The t-ratios are given in parentheses (based on White standard errors).

**Table 3:**  
**Explaining Inter-Provincial Differences in Relative Performance at Targeting  
 Poor Areas**

	(1) Trabajajar 2 spending is exogenous	(2) Trabajajar 2 spending is endogenous
Intercept	5.922 (3.26)	6.382 (2.99)
Trabajajar 2 spending per capita (log)	0.806 (2.62)	0.998 (2.51)
Percent of population with unmet basic needs (log)	-2.124 (3.26)	-2.392 (2.92)
Relative poor area targeting performance of Trabajajar 1	0.420 (5.66)	0.409 (4.99)
Prior participation in Trabajajar 1 or other employment programs	-0.028 (2.25)	-0.031 (2.19)
R <sup>2</sup>	0.712	0.709
Mean dependent variable	1.057	1.057
Standard error of regression	0.756	0.761
F-statistic	10.527	10.353

Note: The dependent variable for columns (1) and (2) is the *PAT* coefficient for Trabajajar 2 divided by Trabajajar 2 spending per person with unmet basic needs. (The *PAT* coefficient for Trabajajar 1 is similarly normalized.) The regression in column (1) uses ordinary least squares, while column (2) uses an instrumental variables estimator in which spending under Trabajajar 2 is treated as endogenous, with spending under Trabajajar 1 as the instrumental variable. There are 22 provinces. The t-ratios are given in parentheses (based on White standard errors).

Figure 1: Changes in program spending across provinces

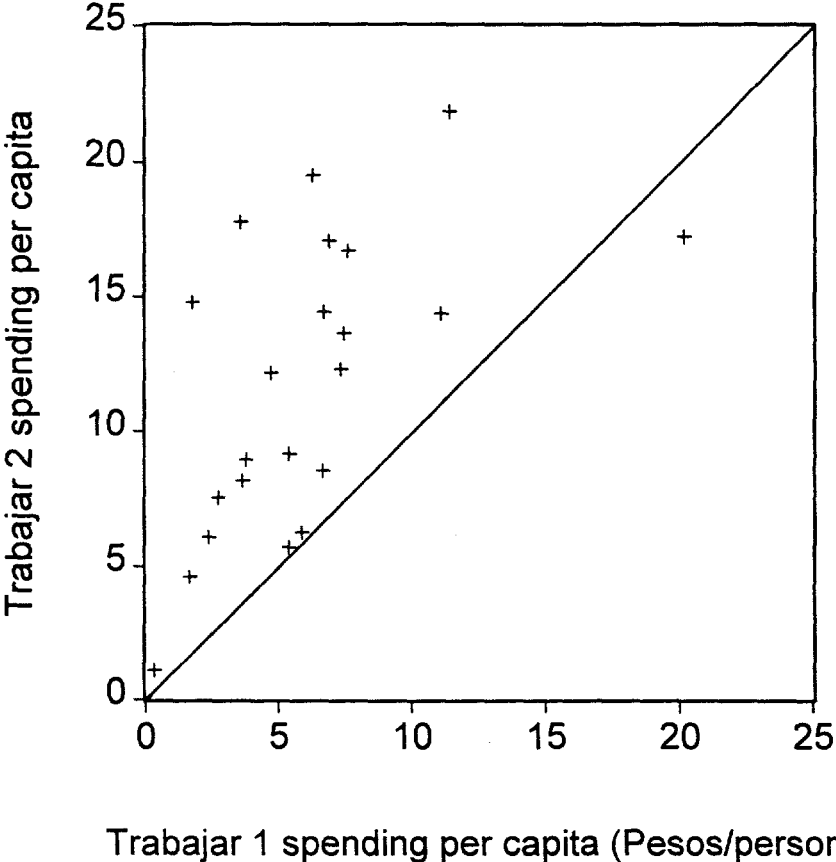


Figure 2: Poor area targeting of the new and old programs

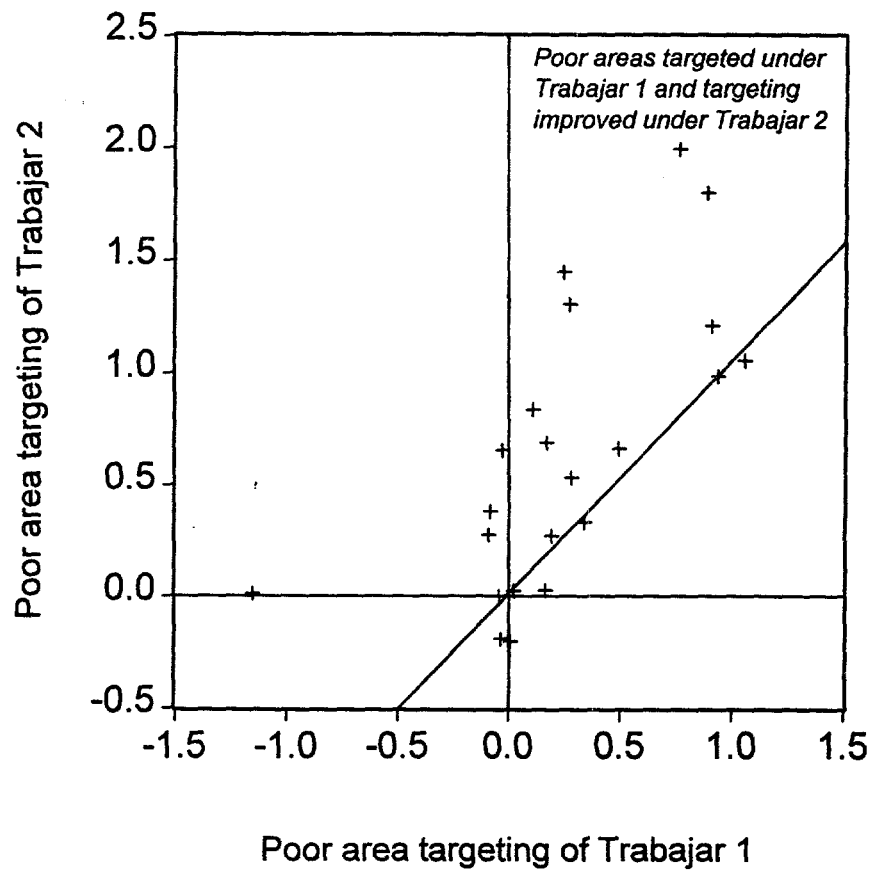


Figure 3: Poor area targeting and provincial poverty rate

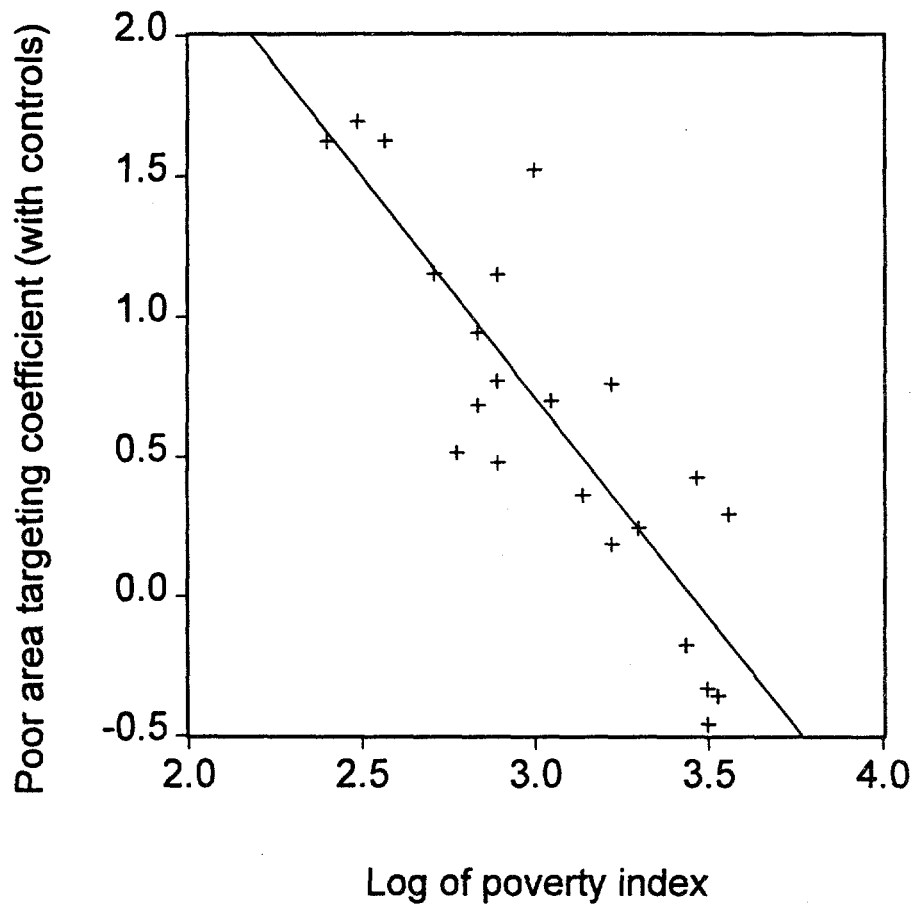
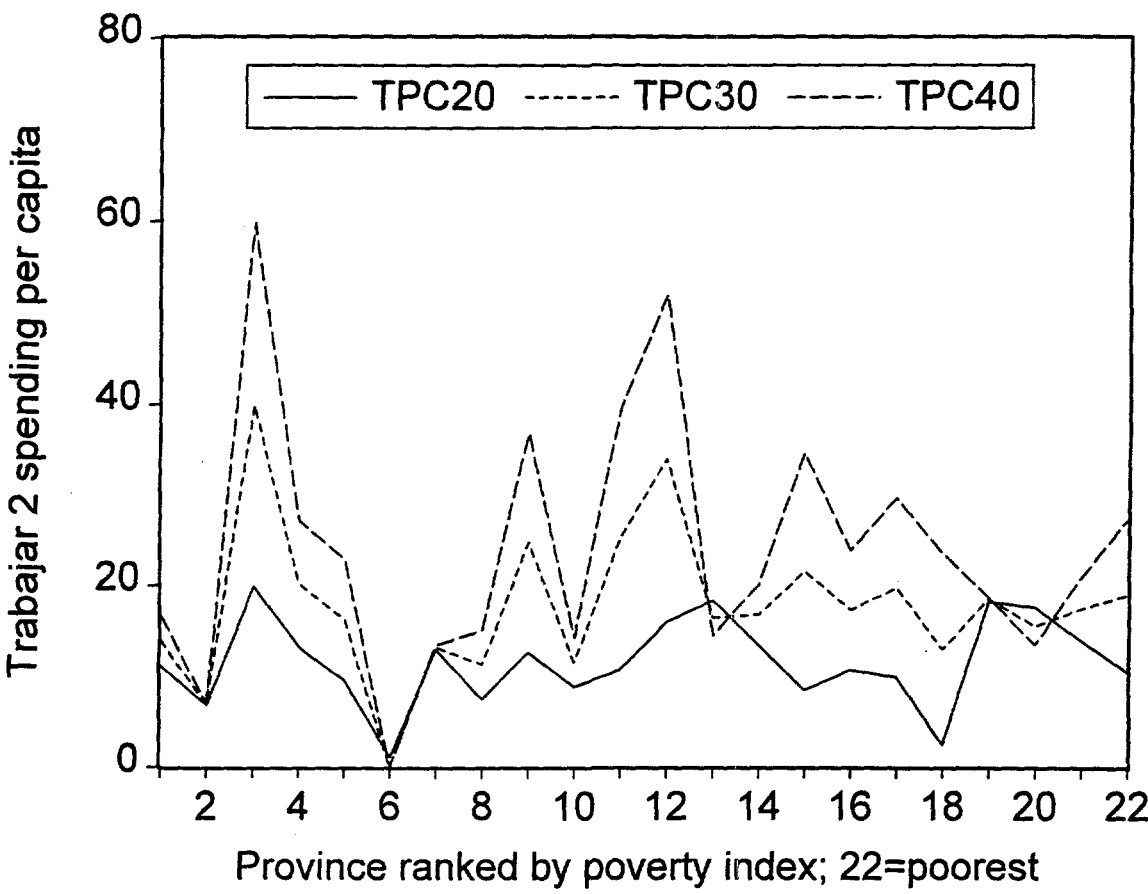


Figure 4: Horizontal inequalities between poor areas



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