

## Monitoring Targeting Performance When Decentralized Allocations to the Poor Are Unobserved

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*How can a central government monitor the performance of a decentralized poverty program when the incidence of the program's benefits is unobserved at the local level? This article shows that, using a poverty map and the corresponding spending allocation across geographic areas, one can identify the latent differences in mean program allocations to the poor and the nonpoor. The national measure of targeting performance can also be decomposed into subgroups. An application to an antipoverty program in Argentina is used to assess the program's performance before and after reforms. Increases in funding and changes in program design brought large gains to the poor, although performance differed across provinces.*

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National antipoverty programs often rely heavily on provincial governments. The central government targets poor provinces in the hope that they will reach their own poor. But unless intraprovincial targeting is successful, even dramatic redistributions from rich provinces to poor ones can have little impact on poverty nationally.<sup>1</sup> The outcome will depend on the behavior of provincial governments, which will differ in relevant ways. Some governments will care more about the poor than others or will face different constraints in their efforts to reach the poor; indeed, simply having a high incidence of poverty can result in worse targeting by a local government (Ravallion 1999). Although decentralizing targeting decisions can allow provinces to exploit local information, some will be better able to secure the gains from doing so than others.

Central monitoring of provinces' performance, and use of the information to encourage better performance, can thus be crucial to success in reaching the poor. However, the data available for monitoring can be limited, because no household surveys were conducted, because the surveys did not ask the right questions

1. For evidence see Ravallion (1993), using data for Indonesia, and Datt and Ravallion (1993), using data for India.

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at the right times, or because the available surveys were not representative at the provincial level. So the incidence of a program's benefits between the poor and the nonpoor—mean allocations conditional on a relevant welfare indicator—will often be unobserved. This can severely constrain the center's ability to establish contracts with the provinces that will ensure the maximum impact on poverty nationally. A poorly informed center might also be inclined to assume the worst; imperfect information about distributional outcomes can then lead to underfunding of antipoverty programs.

In this article I propose a way to measure targeting performance when benefit incidence is unobserved. It is usually feasible to track spending across local government jurisdictions within provinces. It is less common, but still often feasible, to obtain poverty measures for those areas using large sample surveys or census data. For example, a poverty map could be constructed from census data by extrapolating from a smaller living standards survey (as in Hentschel and others 2000 and Bigman and others 1999). Most countries will be conducting population censuses around 2000. So the prospects seem good for obtaining highly disaggregated poverty maps that can be collated with data on program disbursements in each area. However, the poverty data will still not include program participation. Can we infer program incidence knowing only the geographic distribution of program spending and the poverty map?

The article proposes a measure of targeting performance for such settings, namely the regression coefficient of spending on the poverty rate across areas within a government's boundaries. I identify conditions under which this regression coefficient reveals the latent benefit incidence and show that the national measure of targeting performance can be exactly decomposed into between-province and within-province components. This would allow policymakers to assess the contribution to overall performance of interprovincial targeting relative to intraprovincial targeting.

## I. MEASURING TARGETING PERFORMANCE WITHOUT AN INCIDENCE SURVEY

Consider a government that has a budget for a social program. This budget is to be allocated between the poor and the nonpoor living within the government's boundaries. The boundaries embrace a set of finer geographic areas; these might be provinces, if we are monitoring the central government, or municipalities, if we are monitoring a provincial government. The government decides how much should go to poor and nonpoor households within its jurisdiction. However, we do not observe these allocations, but only total expenditures and poverty rates across each of the geographic areas within the government's boundaries—that is, the geographic poverty profile.

### *Intraprovincial Targeting*

To fill in the missing data, we naturally have to make some assumptions. We can assume that the government's (unobserved) optimal allocation to a house-

hold depends on the household's level of welfare. The level of welfare may in turn depend on the area in which the household is located, but I assume that the poverty rate in that area does not affect the household's allocation independent of the household's own level of welfare. In other words, I assume that there is no "poor-area bias" in that, within a province, a poor person living in a poor area expects to get the same amount from the program as an equally poor person living in a rich area. The same holds for the nonpoor. This assumption can be thought of as a form of horizontal equity within provinces.

We can make several observations about this assumption. First, ruling out a poor-area bias does not mean that the government ignores differences in poverty incidence between areas when making its disbursements. Indeed, such differences may be the key information it uses. What we assume is that the government is not biased by those differences in making its allocations. A poorer area still will receive more from a government that is targeting the poor, but simply because there are more poor people in that area.

Second, this is an assumption about the behavior of the government that actually decides how the program's resources should be allocated between the poor and the nonpoor. Suppose that each province in a federal system allocates its budget between the poor and the nonpoor and that there is no poor-area bias within any given province. There still may be such a bias between equally poor people living in different provinces, depending on the behavior of different provincial governments and on the center's budget allocation. Horizontal inequity between provinces is still possible. I will return to this point.

Third, assuming that there is no poor-area bias rules out any effects that the program might have on migration within provinces. If expected allocations for otherwise identical households do not differ, then households will have no incentive to move. The program may, however, affect decisions to migrate between provinces. In the case of the Argentine program studied later in this article, its size and temporary nature make it unlikely to affect residential location, so we can abstract from this complicating factor in the analysis. However, this may be less plausible in other applications. Larger redistributive interventions at the level of the province could induce migration and (hence) fiscal externalities; this raises a different set of issues for central government policy (Wildasin 1991).

Let us first consider how to measure the targeting performance of each province under the assumption of expected horizontal equity. The central government allocates a total budget of  $G$  per capita across  $M$  provinces such that province  $j$  receives  $G_j$  per capita. Given its allocation, a province decides how much should go to the poor,  $G_j^p$  per capita, and to the nonpoor,  $G_j^n$  per capita. Province  $j$  comprises  $M_j$  local government areas, which I call "departments." The per capita allocations to department  $i$  ( $i = 1, \dots, M_j$ ) within province  $j$  can be written as:

$$(1) \quad G_{ij}^n = G_j^n + \varepsilon_{ij}^n$$

$$(2) \quad G_{ij}^p = G_j^p + \varepsilon_{ij}^p$$

for the nonpoor and poor, respectively, where the  $\varepsilon$ s are departmental deviations from the provincial means.

Total disbursements to the poor and nonpoor must exhaust the budget. This creates an accounting identity linking total program expenditures per capita to the poverty rate in a department. Let  $G_{ij}$  denote spending in the  $i$ th department of the  $j$ th province, and let the corresponding poverty rate be  $H_{ij}$ —the headcount index, given by the proportion of the population that is poor (for which the overall poverty rate in the province is  $H_j$ ). Then:

$$(3) \quad G_{ij} = H_{ij}G_{ij}^p + (1 - H_{ij})G_{ij}^n$$

Using equations 1 and 2, we can rewrite equation 3 in the form of a simple linear regression across all departments in province  $j$ :

$$(4) \quad G_{ij} - G_j = T_j(H_{ij} - H_j) + v_{ij}$$

where

$$(5) \quad v_{ij} = \varepsilon_{ij}^n + (\varepsilon_{ij}^p - \varepsilon_{ij}^n)H_{ij}$$

and  $T_j = G_j^p - G_j^n$  is the absolute difference between the average allocation to the poor and the average allocation to the nonpoor in province  $j$ .

I will call  $T_j$  the "targeting differential." If  $T_j$  is negative, then the program favors the nonpoor in absolute terms. If  $T_j$  is positive, then the program favors the poor; the higher is the targeting differential, the more does provincial spending favor the poor.

The targeting differential reflects both the type I and type II errors discussed in the literature.<sup>2</sup> A type I error occurs when not all the poor are covered by a program, whereas a type II error occurs when not all those covered by the program are poor. Correspondingly, we can define the coverage ratio as the proportion of the poor who are covered and the leakage ratio as the proportion of the nonpoor who are covered. The relationship with the targeting differential is clear if we consider a program that transfers a fixed sum of money,  $G$ , per capita: the targeting differential per unit of  $G$  is simply the difference between the coverage ratio and the leakage ratio. With perfect targeting, all of the poor will be covered (no type I errors) and there will be no leakage to the nonpoor (no type II errors). Then  $T/G = 1$ . At the other extreme, if only the nonpoor benefit from the program, then  $T/G = -1$ . If an equal proportion of poor and nonpoor is covered, then  $T/G = 0$ .

How can we estimate the targeting differential? Under the assumption of horizontal equity, the error term given by equation 5 will have a mean of zero for any given province and will be uncorrelated with  $H_{ij}$  since the  $\varepsilon$ s are zero-mean er-

2. See, in particular, Cornia and Stewart (1995), although they use different terminology.

rors within any given province and are uncorrelated with  $H_{ij}$  (and its squared value). Thus  $H_{ij}$  is exogenous in equation 4, and we can estimate  $T_j$  from an ordinary least squares (OLS) regression of  $G_{ij}$  on  $H_{ij}$  across all departments within a given province. Equation 5 indicates that the error term will not be homoskedastic, although this can be dealt with in estimating the standard error of the targeting differential.

The assumption of horizontal equity thus justifies estimating the targeting differential by a simple linear regression of program spending per capita on the poverty rate across all local government areas within a given province. The assumption makes up for the missing data on the incidence of program spending.

### *Interprovincial Targeting*

Just as we estimated targeting differentials within provinces, we can estimate the center's interprovincial targeting differential,  $T^P$ , by regressing the program allocation across provinces  $G_j$  ( $j = 1, \dots, M$ ) on the provincial poverty measures  $H_j$  ( $j = 1, \dots, M$ ). This regression is a natural measure of how well the center's allocation matches the provincial poverty map.

We cannot, however, interpret  $T^P$  in the same way as  $T_j$  unless we make a stronger assumption. The further assumption of horizontal equity between provinces is sufficient for the OLS estimate of  $T^P$  to be a consistent estimate of the difference between the mean allocations to the poor and the nonpoor over the whole country. However, the absence of poor-area bias within each province clearly does not imply that equally poor people living in different provinces will receive equal amounts in expectation. Differences between provinces in their distributional objectives and in the constraints they face (including the amount received from the center) could produce horizontal inequity between them. To some extent, the center will be able to counter these differences through its spending allocations and other administrative efforts designed to ensure that provinces behave in line with its objectives. However, since the center does not actually decide who gets how much under the program, we cannot be confident that horizontal equity will emerge at the national level.

Using equation 4, we can develop a test to measure the extent of horizontal inequity between the expected program allocations to departments that have the same poverty rate but are located in different provinces. Let  $H^*$  denote a fixed reference value of  $H_{ij}$ . The expected allocation to a department with poverty rate  $H^*$  is then:

$$(6) \quad G_j^* = G_j + T_j(H^* - H_j)$$

In turn, we know that:

$$(7) \quad G_j^* = H^* G_j^P + (1 - H^*) G_j^N$$

If there is horizontal equity between provinces, both  $G_j^P$  and  $G_j^N$  will be uncorrelated with  $H_j$ . Although we do not observe either  $G_j^P$  or  $G_j^N$ , we can see from equation

7 that  $G_j^*$  is a fixed-weight combination of the two. So a testable implication of horizontal equity between provinces is that  $G_j^*$  is uncorrelated with  $H_j$ . I test this implication later in the article.

### Decomposing the National Targeting Differential

We can also estimate a national, interdepartmental, targeting differential,  $T^D$ , by regressing the values of  $G_{ij}$  on  $H_{ij}$  across all departments, irrespective of their province. Again, we cannot interpret this differential in the same way as the provincial targeting differentials, unless there is horizontal equity across provinces. Still, the estimate of  $\hat{T}^D$  gives a useful summary statistic of overall performance in targeting poor areas. The OLS estimate of the national targeting differential can be decomposed exactly into between-province and within-province components:

$$(8) \quad \hat{T}^D = S^P \hat{T}^P + \sum S_j \hat{T}_j$$

where  $S^P$  is the between-province share of the total (interdepartmental) variance in poverty rates, and  $S_j$  is the province-specific share. The first term on the right side of equation 8 is the "between-provinces" component, and the second term is the "within-province" component. Proving that the decomposition holds is straightforward (for details see Ravallion 1998: app.).

For the decomposition to be exact, the estimate of  $T^P$  must be weighted by the number of departments in each province (table 1). The weighting is readily done by multiplying all variables (including the intercept) by the square root of the number

Table 1. *Decomposition of the National Poor-Area Targeting Differential*

Decomposition: $\hat{T}^D = S^P \hat{T}^P + \sum S_j \hat{T}_j$		
	Targeting differentials <sup>a</sup>	Weights <sup>b</sup>
<i>Interdepartmental</i>	$\hat{T}^D = \frac{\sum \sum (G_{ij} - G)(H_{ij} - H)}{\sum \sum (H_{ij} - H)^2}$	-1
<i>Interprovincial</i>	$\hat{T}^P = \frac{\sum M_j (G_j - G)(H_j - H)}{\sum M_j (H_j - H)^2}$	$S^P = \frac{\sum M_j (H_j - H)^2}{\sum \sum (H_{ij} - H)^2}$
<i>Intraprovincial</i>	$\hat{T}_j = \frac{\sum_{i=1}^{M_j} (G_{ij} - G_j)(H_{ij} - H_j)}{\sum_{i=1}^{M_j} (H_{ij} - H_j)^2}$	$S_j = \frac{\sum_{i=1}^{M_j} (H_{ij} - H_j)^2}{\sum \sum (H_{ij} - H)^2}$

Note:  $G_{ij}$  is program expenditure per capita in the  $i$ th department of the  $j$ th province. The mean for that province is  $G_j$ , and the national mean is  $G$ . Province  $j$  contains  $M_j$  departments.  $H_{ij}$  is the poverty rate (the headcount index) in the  $i$ th department of province  $j$ , with provincial mean  $H_j$  and national mean  $H$ . Indexing of the summations is only given when there is any ambiguity.

a. Regression coefficients of public spending on the poverty rates across geographic areas.

b. Shares of the geographic variance in poverty.

of departments prior to running the regression of the  $G_s$  on the  $H_s$  across provinces. Each targeting differential is additive intertemporally, so the annual targeting differential can be obtained as the sum of quarterly targeting differentials.

To see how these tools can be used to compare two programs, suppose that the poverty rates, in addition to being exogenous, are also fixed, taking the same values for both programs. For example, assume that the poverty rates were measured before either program was introduced (as in the empirical application below). Then  $S^P$  and  $S_j$  are also fixed, and we can decompose the changes in  $T^D$  in a straightforward way:

$$(9) \quad \Delta T^D = S^P \Delta T^P + \sum S_j \Delta T_j$$

where  $\Delta$  denotes the difference between the two programs.

## II. APPLICATION TO ARGENTINA'S TRABAJAR PROGRAMS

With financial and technical support from the World Bank, the Government of Argentina introduced the Trabajar II Program in May 1997. This temporary employment program was established in response to a sharp increase in unemployment, which was hurting the poor in particular. For example, while the average unemployment rate reached 17 percent in 1996 in Greater Buenos Aires, it was 40 percent among the poorest income decile. Trabajar II replaced a smaller program, Trabajar I. In addition to a larger overall budget, Trabajar II had a number of features that distinguished it from Trabajar I. The government strengthened the program's poverty focus, putting greater emphasis on reaching poor areas. The center included poverty measures in its budget allocation rules and in the selection criteria for subprojects. The poverty focus was also made clearer to provincial administrators.

Trabajar II sought to reduce poverty in two ways. First, it tried to develop badly needed community infrastructure and services in poor areas. Local governmental and nongovernmental organizations proposed the subprojects and had to cover nonwage costs. The projects had to be technically viable and were chosen on a competitive basis according to a point system set by the center. The center awarded points according to the poverty rate of the municipality in which the proposed project was located (using a census-based measure described in the next section), the type of project proposed, workers' willingness to work for a lower wage, and the amount of support the area had already received from the program. Participating workers could not receive unemployment benefits or take part in any other employment or training program. It is unlikely that a temporary program such as this would affect residential location, so migration was not a concern.

Second, by providing short-term work at relatively low wages, the program aimed to self-select unemployed workers from poor families. The wage rate on the program (\$200 per month) was set at a level that would be unlikely to attract

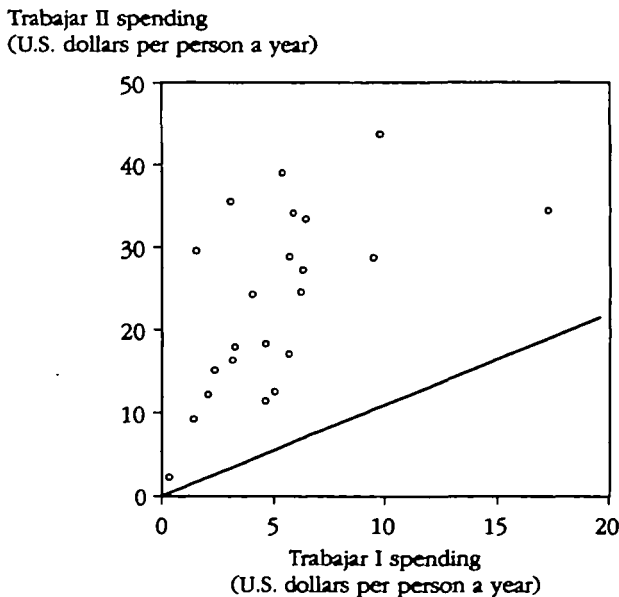
nonpoor workers, even those who were unemployed, or to draw poor workers away from regular jobs. A subsequent assessment of participating workers found that 80 percent came from the poorest income quintile nationally and that 50 percent came from the poorest decile (Jalan and Ravallion 1999).

The reforms resulted in sizable changes in the center's budget allocation across provinces (figure 1). Although there was a positive correlation between the two programs (0.58, significant at the 5 percent level), there were some large changes in the provincial allocations. Later I measure how effective these changes were in improving the program's ability to reach poor areas.

Management of the project was decentralized at the provincial level, with the center setting budget constraints and the overall rules (notably the point system described above). Interviews with numerous program staff at both national and provincial offices suggested that the efforts of provincial managers to solicit good project proposals from their poor municipalities and to ensure that the proposals were technically viable were likely to be crucial in determining the targeting differential. The provincial office could then help to secure funding to cover nonwage costs from other (national and provincial) programs. It was clear from these interviews that the local managers in some provinces were professional technocrats who aimed to implement the program's objectives in an efficient way. In other provinces, however, managers were swayed more by national or local politics in deciding which areas should get the most attention.

Equally poor people within a province were likely to receive different amounts from the program depending on where they lived. To some extent these differences were random, uncorrelated with how poor the local area was. For ex-

Figure 1. *Program Disbursements by Province*





ample, in discussions with program staff at the municipal level, it was clear that some mayors were far more in tune with the program's aims than others and that some were better informed than others about sources of finance to cover nonwage costs. It is not clear whether these differences should lead us to seriously question the assumption of horizontal equity. Mayors in some poor municipalities appear to have been better informed about sources of cofinancing for a program such as this than mayors in rich municipalities.

There is one source of cofinancing that might lead to horizontal inequities: financing from the municipality's own resources. The benefits to the poor will depend in part on the ability of local communities to cofinance viable projects, and poorer areas may be more severely constrained in this respect. Thus the germ of a possible problem in reaching poor areas lies at the heart of the program's design, whereby the center finances only the labor costs of subprojects, leaving the cofinancing to local areas. Poor people living in a rich municipality might then have a better chance of gaining access to the program than those living in a poor municipality. Any bias arising from this difference would probably entail underestimation of the targeting differentials.

However, it seems unlikely that this feature of the program would seriously bias the estimated targeting differentials. For one thing, the design of the program, including preferential treatment of project proposals from poor areas, will help to avoid this problem to some extent. And—possibly more important—the provincial government has the power to circumvent cofinancing constraints in poor areas. So the province should still be able to achieve any desired incidence of program spending within its own boundaries. The problem of cofinancing then reflects the provincial government's desired incidence of program spending, which will not bias the estimated targeting differentials. Horizontal inequities between provinces may remain, however, although we can test for these, as I do below.

#### *Targeting Differentials, before and after Program Reform and Expansion*

We can use the methods proposed here to assess how well Trabajar II performed in reaching the poor and whether there was an improvement over Trabajar I. The empirical work draws on data for Trabajar I (March 1996–April 1997) and the first six months of Trabajar II (May 1997–October 1997). The work was done as part of the project's concurrent monitoring and evaluation, and the results were rapidly made available to the project's management. The analysis here was reviewed with the government's project team in the Ministry of Labor on a Bank supervision mission in November 1997. The quality of the information system for project monitoring set up by the Ministry of Labor's project office made such rapid feedback possible. After that first demonstration of the methodology, the project staff were able to do the evaluation themselves, making it possible to regularly monitor targeting performance.

The analysis requires data on disbursements by local government area and a corresponding poverty map. In Argentina the geographic level below the prov-

ince is the department, of which there are 510 nationally. The poverty measure available at the department level is the proportion of households with unmet basic needs (UBN), based on the 1991 census. The UBN index is a composite of residential crowding, sanitation facilities, housing quality, educational attainment (of adults), school enrollment (of children), employment, and dependency. Since it is based on the census, the index covers the whole population and is representative at the department level. (By contrast, none of the household surveys for Argentina is representative at that level or even at the provincial level.) The UBN index is the main poverty data that provincial offices used in setting priorities for Trabajar subprojects; maps of the index by department were often displayed in provincial Trabajar offices. The index is somewhat out of date, although this has the advantage that one can safely treat it as exogenous to the program. Also the composition and weighting of the component indicators are not beyond question. Measurement error will create an attenuation bias in the estimated targeting differential.

First I look at how the budget allocation between provinces changed with the program's reform and expansion. Under Trabajar I the regression of spending per capita on the poverty rate gives an estimated interprovincial targeting differential ( $T^p$ ) of \$25 per person, which is significantly different from zero at the 5 percent level ( $t$ -ratio = 2.12).<sup>3</sup> Over the 14-month duration of Trabajar I this differential was equivalent to \$21 a year. Under the assumption of horizontal equity between provinces, the OLS estimate of  $T^p$  is a consistent estimate of the difference in average allocations to the poor and nonpoor nationally. Later I determine whether the data are consistent with this assumption.

The targeting differential rose appreciably in Trabajar II. The estimated  $T^p$  was \$74 per person over six months, equivalent to \$148 a year, and this estimate is highly significant ( $t$ -ratio = 4.85). These regressions are weighted by the number of departments (see table 1). The unweighted estimates of  $T^p$  are \$13 a year ( $t$ -ratio = 1.86) for Trabajar I and \$120 ( $t$ -ratio = 7.51) for Trabajar II.

The implied allocation to the nonpoor was not significantly different from zero for either program ( $t$ -ratios of 0.19 and 1.21 for Trabajar I and II, respectively). Thus the expansion and reform of Trabajar I resulted in a sevenfold increase in the implicit allocation to poor households.

Since the reforms included considerable efforts to ensure that the program's extra disbursements were targeted to poor provinces, the improvement in the interprovincial targeting differential is not too surprising. However, the allocation between provinces is far easier for the center to control than is the allocation within provinces, which I turn to next.

Now I ignore the provinces and look at the allocation across all 510 departments. The national targeting differential ( $T^p$ ) for Trabajar I is \$35 per person a

3. As expected, the residuals in estimating this and the other targeting differentials indicated heteroskedasticity. All of the  $t$ -ratios are based on White standard errors, corrected for any general type of heteroskedasticity present in the data.

year and is significantly different from zero ( $t$ -ratio = 4.29). Under Trabajar II the estimate of  $T^D$  rose to \$160 per person a year ( $t$ -ratio = 10.33).

How much of this improvement in the interdepartmental targeting differential was due to the center's improved targeting to poor provinces? The between-province component accounts for 28 percent of the total sum of squared deviations from the mean UBN index. Clearly, then, better targeting to poor provinces alone does not ensure that poor departments will be reached. Using the decomposition in table 1, I find that 17 percent ( $[0.28 \times 21] / 35$ ) of the interdepartmental targeting differential under Trabajar I was attributable to the allocation between provinces; the rest was due to targeting within provinces. Under Trabajar II the share due to allocation between provinces rose to 26 percent ( $[0.28 \times 148] / 160$ ). The center's efforts to target poor provinces improved the program's overall performance in reaching poor departments, but the bulk of the interdepartmental targeting differential nationwide was due to intraprovincial targeting.

Turning to the changes over time, recall that  $\Delta T^D = \$125$ ,  $\Delta T^P = \$127$ , and  $S^P = 0.28$ . Thus (using equation 9) I find that \$36 (28 percent) of the improvement in targeting performance across all departments can be attributed to the center's success at better targeting poor provinces. The remaining 72 percent came through better targeting within provinces.

Since the absolute level of spending was higher under Trabajar II, one expects the poor to be better off under Trabajar II than under Trabajar I, even without any improvement in targeting. Consider, for example, a department in which 42 percent of the population have unmet basic needs—one standard deviation above the national mean calculated over all departments. Under Trabajar I, this department would have received \$14 per person in one year. Under Trabajar II, the same department would have received \$64 per person, a gain of about \$50 per person.

Although there was a large absolute gain in the implicit allocation under Trabajar II, part of this gain was attributable to the center's higher total outlays. Given the mean allocation of Trabajar II and no improvement in targeting (that is, assuming that the targeting differential for Trabajar II was the same as that for Trabajar I), we would expect a department with a UBN index of 42 percent to have received \$52. Thus about \$12 of the gain was due to improved targeting, and \$31 was due to higher average outlays (\$31 being the annualized value of the difference between the mean spending under Trabajar II of \$20 and that under Trabajar I of \$10). To give a second example, in a department with a UBN index of 58 percent (two standard deviations above the mean and among the poorest 5 percent of departments), the gain was about \$72, of which \$26 was due to improved targeting. The higher was the department's poverty rate, the greater was its gain from the program's expansion and reform, and the greater was the share of the gain due to improved targeting.

Although the allocation across provinces improved under Trabajar II, still two-thirds of the gain in overall performance came from better targeting within provinces. The provinces differed greatly in their success at reaching the poor. (De-

tailed results by province can be found in Ravallion 1998.) Under Trabajar I, 12 provinces had targeting differentials that were not significantly different from zero (figure 2). Only one province had a targeting differential that was significantly less than zero, although the differential was still small (-0.09).

The number of provinces targeting the poor rose slightly with the expansion and redesign of the program. The targeting differential was significantly positive for nine provinces under Trabajar I and eleven provinces under Trabajar II. Twelve of the provinces noticeably improved their performance; nine of these were provinces that had a significantly positive targeting differential under Trabajar I. There was also considerable re-ranking. For example, the province with the highest targeting differential in Trabajar I did not improve its performance in Trabajar II and fell to sixth.

### *Horizontal Inequity between Poor Areas in Different Provinces*

Did horizontal inequity exist between provinces in the amount that equally poor departments received from the program? The extent of such inequity indicates how much the federal system constrained the center from achieving its desired transfers to the poor. It also tests the assumptions underlying my interpretation of the interprovincial targeting differential.

Consider a reference poor area with poverty rate,  $H^*$ , fixed across all provinces. Figure 3 plots the expected value of program spending,  $G^*$ , as implied by equation 6, for all provinces ranked by their UBN index.<sup>4</sup> The correlation between  $G^*$  and the actual poverty rate is a testable implication of the assumption of horizontal equity between provinces.

I can make four observations from figure 3. First, there is considerable horizontal inequity, as indicated by the large differences in the allocations to departments that have the same poverty rates but are located in different provinces. For example, a department in which 40 percent of the people have unmet basic needs (about the fifth poorest percentile in the distribution of poverty across departments) can expect to receive anything from zero to five times the national mean allocation, depending on the province to which it belongs.

Second, the absolute magnitude of the differences tends to be larger the poorer is the reference area; the standard deviations (coefficients of variation) are 4.8 (42 percent), 8.4 (47 percent), and 14.0 (58 percent) for  $H^*$ 's of 20, 30, and 40 percent, respectively. Third, in almost all provinces the higher is the value of  $H^*$ , the greater is the program allocation. This is not surprising, given that most provinces are targeting the poor. And fourth, there is no correlation between  $G^*$  and the level of poverty in a province; the correlation coefficients between expected Trabajar II spending per capita in the reference poor area and the mean UBN index in the province are 0.11, 0.01, and -0.03 for  $H^*$ 's of 20, 30, and 40 percent, respectively.

4. The unweighted mean UBN is 22.5 percent with a standard deviation of 7.7 percent. I also tried  $H^*$ 's of 15 and 50 percent. These followed the same patterns described below, but are omitted to simplify the figure.

Figure 2. Targeting Differentials by Province before and after Program Reform and Expansion

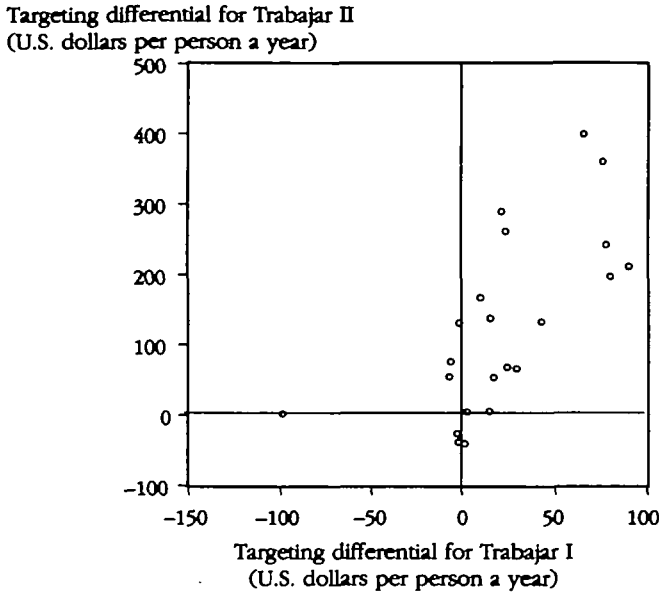
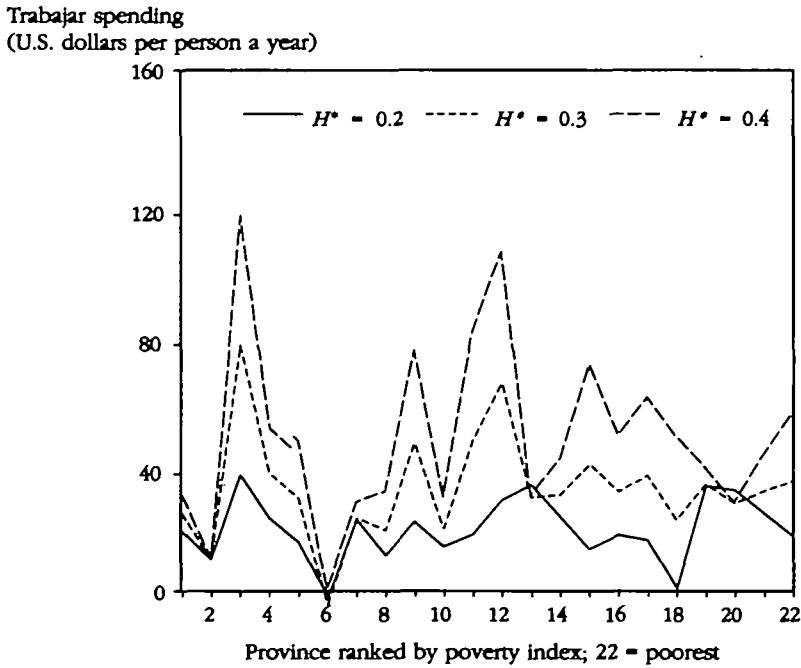


Figure 3. Horizontal Inequities between Equally Poor Areas in Different Provinces



So although I found considerable horizontal inequity, it is uncorrelated with provincial poverty rates. The data in figure 3 are consistent with horizontal equity in expectation between equally poor departments found in provinces with different overall poverty rates. This result supports my interpretation of the interprovincial targeting differential as the expected difference between the amount going to the poor and the amount going to the nonpoor nationally.

### III. CONCLUSIONS

Geographically decentralized social programs can have different outcomes for poor people living in different areas, depending on the objectives and constraints facing provincial governments. It is well recognized in principle that this diversity in performance has important implications for the central government's decisions in allocating funds and designing programs. Yet the center is often poorly informed about the performance of different provinces in reaching the poor. This lack of information can severely limit the options for designing contracts that will improve performance, and it can also result in poverty programs being underfunded.

In this article I have proposed a measure of performance that can be estimated even when the incidence of social spending is unobserved. The measure requires data on the allocations of total spending by geographic area and a matching poverty map. Then public spending is regressed on the poverty rates across areas. The interpretation of the regression coefficient assumes that there is horizontal equity within provinces—meaning that equally poor people in the same province receive the same amount in expectation, irrespective of the incidence of poverty in the area in which they live. This assumption is more defensible within provinces (or at whatever level the programs' allocations are decided) than between provinces, although the method allows a test for horizontal inequity between provinces.

Under the assumption of horizontal equity, the regression coefficient consistently estimates a targeting differential given by the difference between the program's average allocation to the poor and the nonpoor. The article also showed how the national targeting differential across all local government areas can be decomposed so that we can assess the contribution of the center's targeting of provinces relative to the efforts of the provinces themselves.

I applied these methods to monitor the performance of the Trabajar II Program in Argentina relative to its predecessor, Trabajar I. The new program entailed a substantial reallocation of program resources across Argentina's provinces, with higher total spending. The program design also changed, giving provinces stronger incentives to reach the poor. The interprovincial budget allocation under Trabajar II was more heavily influenced by differences in provincial poverty indicators. The real wage rate for the work made available under the project was maintained at a low level. A high weight was given to proposals from poor areas in a points system designed to assess competing subprojects *ex ante*. And efforts were made to strengthen the capacity of provincial offices to help

poor areas mount projects and to ensure that provincial project managers were in tune with the program's overall goals.

These changes improved the program's success at reaching poor provinces and at reaching the poor within provinces. The performance in reaching poor areas (irrespective of their province) improved nationally. The results suggest that the center's choices with respect to program funding and design can matter greatly to the targeting performance of decentralized social programs.

On decomposing the national targeting differential, I found that only 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 was due to better targeting within provinces. Performance also differed across provinces, with some registering more substantial gains and others none. This difference was reflected in considerable horizontal inequity between equally poor areas in different provinces, although this horizontal inequity was uncorrelated with the level of poverty in the province—supporting the interpretation given to the interprovincial targeting differential.

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