Conditionality and the impact of program design on household welfare:
Comparing two diverse cash transfer programs in rural Mexico[1]

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Abstract

In this paper, we examine how the design of cash transfer schemes influences household welfare outcomes with particular reference to the influence of transfers on conditioned outcomes, such as schooling, health and investment. We do this by examining two innovative cash transfer schemes initiated by the Mexican government in the last decade: PROGRESA, which is a national anti-poverty scheme directed at chronic rural poverty, and PROCAMPO, which is a scheme designed to compensate farmers for the negative price effects of NAFTA. The schemes differ in that PROGRESA is targeted at women and conditioned on schooling and health outcomes and PROCAMPO is generally targeted at men and conditioned on land use. The analysis of data collected for an evaluation of PROGRESA suggest that the overall effects of the programs, as measured by total and food consumption expenditure, are not different. However, PROGRESA leads to greater schooling expenditure and school attendance as well as increased health outcomes. On the other hand, PROCAMPO is found to lead to increased investment in agriculture. The results suggest that conditionality may have little effect in terms of short-term welfare outcomes, but do influence both longer-term (human capital) and medium term (productive) investment. Policy makers must consider both whether or not conditions should be placed on a program, and the type of condition, depending on what they perceive to be the desirables outcomes of the transfer scheme.

I. Introduction

In recent years, cash transfer schemes have become increasingly popular in developing countries as an alternative to traditional broad-based policies, such as subsidies, and as a more efficient mechanism for sharply targeting interventions. One important use of cash transfers has been in anti-poverty programs, which have tended to be interventions that condition transfer payments upon specific human capital enhancing behaviors such as school attendance or health check-ups. Programs of this nature are currently being implemented in Bangladesh, Brazil, Colombia, Honduras, Jamaica, Mexico, and Nicaragua. Cash transfer schemes have also been linked specifically to agriculture usually as compensation for policy changes that included the ending of government agricultural subsidies via output and input prices and trade liberalization, on the theory that terminating these kinds of subsidies removes market distortions allowing resources to be allocated more efficiently. Mexico and Turkey have implemented conditional cash transfer programs linked to agricultural reform.

Rarely are cash transfer programs initiated without some conditions placed on the recipient population. In the case of agricultural programs, there is a debate about whether such conditions (i.e. decoupling payments from production) are necessary or even optimal (OECD, 2000). Conditionality comes at a cost because of the need to monitor the actions of the recipient population. In the case of the anti-poverty programs, schooling enrollment and visits to health centers have to be monitored, as does land use in the case agricultural programs. There is also some question about whether conditions are even necessary to bring about desirable outcomes. For example, demand for schooling is likely to rise with increases in income regardless of whether school attendance is required. Providing the transfers without conditions may be sufficient, particularly if the transfers represent a substantial proportion of income. Additionally, conditions may lead to limited responses by recipients and possibly even unintended consequences. In the case of agricultural programs, the concern is that conditions placed on transfer payments to farmers induce them to stay in agriculture and continue to invest in agricultural production instead of more profitable non-agricultural activities (Beard & Swinbank, 2001; Guyomard, 2000; Harvey, 1998).

Even if it is determined that conditions alter recipient behavior in a positive manner, there is some question about what conditions should be placed on households, particularly when the purpose of the cash transfer scheme is to reduce poverty. While we would like to be able to determine the "best" conditions to place on recipients, defining such conditions depends on the particular objectives of the transfer scheme, as well as assumptions about the best ways to meet those objectives and the predicted response of recipients. In addressing poverty, the cash transfer schemes noted above tend to focus on schooling and health outcomes under the assumption that long-term human capital development is the best way to address poverty and that children's school attendance and health visits are the best way to improve human capital. An alternative approach would be to focus on the shorter-term productive capacity of recipient households by using transfers to encourage investment. One argument for this approach is that it is more sustainable in that income generated from such investment will lead to higher income for the household. If conditions are to be required of recipients, the design of the conditions needs to be carefully considered.

The objective of this paper is to examine how the design of cash transfer schemes influences household welfare outcomes with particular reference to the influence of transfers on conditioned outcomes, such as schooling, health and investment. This is accomplished by comparing two cash transfer schemes initiated in Mexico in the last decade, PROGRESA and PROCAMPO. PROGRESA (National Program for Education, Health and Nutrition) is a national anti-poverty

program specifically designed to deal with chronic rural poverty. Cash transfers are conditional on school attendance by children, basic health care checkups by all family members, and attendance at public health lectures. PROCAMPO (Program of Direct Payments to the Countryside) was designed to compensate staple crop producers for losses expected under NAFTA. The producer prices of basic crops were expected to drop sharply since these prices had been supported at levels above the border price. Cash transfers under PROCAMPO are conditioned on the continued use of the land in a manner deemed acceptable by the program. Although not explicitly a poverty alleviation program, the transfers are widely distributed across agricultural Mexico and many recipients are categorized as poor. In this paper, we use a unique data set that was collected for an evaluation of PROGRESA, but that includes PROCAMPO recipients and data on PROCAMPO transfers.

The next section presents a description of the two cash transfer programs that are evaluated in this paper. Section 3 follows with a discussion of the theoretical basis for conditional cash transfers, the effect of eligibility requirements particularly the gender-targeting, and presents our main hypotheses. Section 4 discusses the data, while Section 5 presents our empirical approach and addresses a number of econometric issues. Results are presented in Section 6 and the conclusions and policy implications in Section 7.

II. Cash transfers in Mexico: PROGRESA and PROCAMPO

A. PROCAMPO
PROCAMPO initiated transfers in the winter, 1994 agricultural season and was designed as a 15 year transition to free trade. Eligibility, and therefore the maximum level of PROCAMPO transfer payments, vary across households and are based on household behavior during the pre-PROCAMPO period. PROCAMPO provides eligible agricultural producers with a fixed payment per hectare. This payment is decoupled from current land use and is the same across the whole country. The level of eligibility is dependent on the total hectares of nine key crops (corn, beans, rice, wheat, sorghum, barley, soybeans, cotton and safflower) that were planted in any of the three corresponding (autumn-winter or spring-summer) growing seasons prior to and including August, 1993. Eligibility was tied to particular parcels and those with usufruct over these land parcels, not specific farmers, and payment should go to whomever is planting the property, whether owner, renter or sharecropper. The eligibility roster was fixed prior to commencement of the program; no new properties have been added since 1994.

Theoretically, the farmer receiving payment for a particular property may change, depending on who is using the land, though in practice most benefits accrue to the owner, either directly or through the rental price. Since there are potentially two agricultural seasons per year, PROCAMPO payments may be made up to twice a year, though in general only farmers with access to irrigation can take advantage of the second agricultural season. Payments correspond to the amount of land currently under production or that is part of an official environmental management program, an amount that cannot exceed the amount of land registered in the eligibility roster. Fallow land does not merit payment, making it unlikely that households have received payment every year since 1994 for a specific parcel of land. The conditionality of the cash transfer is that farmers must prove that the parcel is being used in a manner deemed appropriate by the program. Monitoring of actual land use is haphazard, and devices are occasionally employed to skirt this requirement. However, given the program is based on past agricultural production and the requirement that farmers continue to produce or participate in an official environmental management program, the intervention is closely and intentionally linked to agricultural production.

Every season after planting[3], farmers must go to one of the 700 CADER (Center for the Assistance of Rural Development) offices around the country with proof of planting to solicit their payment. Payments are in the form of checks distributed at the CADER offices and, in 1997, averaged US$329 per recipient and US$68 per hectare (Sadoulet, et al, 2001). An additional benefit of participating in the program is that PROCAMPO qualification certificates can be used as collateral for borrowing from commercial banks and input retailers, although often at very high interest rates.

PROCAMPO covers 95 percent of the cultivated area in Mexico that had been planted in corn, beans, sorghum and wheat (SAGAR, 1998) (approximately 14 million hectares), reaches almost three million producers, and provides annual payments of over US$1 billion (Casco Flores, 2001). PROCAMPO is particularly important in the ejido (land reform) sector where 84 percent of ejidatarios participated in PROCAMPO and received payments for, on average, 5.2 hectares (Cord and Wodon, 1999). Since PROCAMPO is distributed on a per hectare basis, larger farms have tended to get higher total transfers. Households with less than 5 hectares make up 45 percent of recipients but receive only 10 percent of total transfer payments (SAGAR, 1998). However, PROCAMPO provides a uniform payment per hectare regardless of yield or if the output was sold on the market. PROCAMPO thus over compensates smallholders who may have had limited yields and reaches households who did not benefit from pre-NAFTA price supports because they had no marketed surplus (Martinez, 1999).

B. PROGRESA

PROGRESA was initiated in Mexico in 1997 as a mechanism for addressing extreme poverty in rural areas. A primary thrust of PROGRESA is to develop the human capital of poor households by improving education, health and nutrition outcomes. The condition for receipt of transfers by participant households is to visit health care clinics and to send children to school. To help achieve these objectives, transfers, with rare exception, are provided directly to mothers under the assumption they are more likely to use funds in a manner that will be beneficial to the development of their children.

Because PROGRESA targets poor households, criteria were developed for determining eligibility based on household well-being. This selection of eligible households was done in three stages (see Skoufias, et al, 2001). First, potential recipient communities were identified as poor based on an index of marginality developed from the national population census using community data including the share of illiterate adults, access to water, drainage and electricity, number of occupants per room, dwellings with a dirt floor and population working in the primary sector. More marginal communities were considered potential target locations and were further evaluated based on location and existence of health and school facilities. After communities were identified, the second step was to select households for participation in PROGRESA based on data collected from a household census within the community. Scores were produced for each household using discriminant analysis and households above a certain line were included as beneficiaries. The third step was to present a list of these households to the community assemblies for review and discussion, though in practice these lists were rarely modified.

By the end of 1999, PROGRESA provided bimonthly transfers to approximately 2.6 million households or about 40 percent of all rural families and 11 percent of all Mexican families. The

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[3] Recently, PROCAMPO has shifted payments to farmers to prior to planting in order to allow farmers to use the transfer directly for agricultural production. At the time the data for this study was collected, transfer payments were made at the end of the cropping season.

program operated in almost 50,000 communities, and had a budget of US$777 million or nearly 20 percent of the Mexican government's budget allocation for poverty alleviation (Skoufias and McClafferty, 2001). Because PROGRESA conditions payment of transfers on school attendance and visits to health care facilities, it was expected and has been shown that the program had a significant impact on education attendance and health outcomes (Skoufias and McClafferty, 2001).

Households receiving PROGRESA are not permitted to receive other forms of anti-poverty or education subsidies, but this does not apply to PROCAMPO benefits since it is not an anti-poverty program. Thus PROGRESA and PROCAMPO transfers are provided to eligible rural households at the same time. A large number of households are eligible to receive transfers from both sources.

III. Cash Transfer Schemes: Theory, Eligibility, and Hypotheses

A. Theory

Conditional cash transfer programs typically provide a cash payment if certain 'conditions' are met – classic examples are school attendance of at least 85% or scheduled preventive health care check-ups. Conditions are set in an effort to induce a particular response by recipient households. Because of these conditions, transfers exert both a substitution and an income effect. In the case of school attendance, the full price of schooling is now made cheaper to the household by the amount of the transfer; an unconditional cash transfer only exerts an income effect upon the household, since the household can allocate its collective resources (time and money) to any activity. Assessing the impact of the conditional part of a conditional cash transfer scheme entails estimating the relative weight of the income and substitution effects. Note that the concepts of income and substitution effects are relevant for small changes only, and not large discontinuous changes like school enrolment or similar dichotomous choices. A substitution effect of zero implies that in the given situation, an unconditional scheme would have the same effect on household behavior as the conditional scheme, provided the transfer is infra-marginal. Insofar as conditional schemes are extremely cumbersome and complicated to execute, the 'value' of the condition is an important piece of information for the policy maker.

The two programs presented in this paper are both conditional yet, as noted above, these conditions vary. Whether the two programs lead to similar outcomes depends on the strength of the income and substitution effects of each program. If income effects dominate in both cases, we expect little difference in the outcomes suggesting a transferred peso has a similar effect regardless of the conditions placed on the recipient. Alternatively, if there are strong substitution effects in either case, outcomes may vary indicating conditionality matters.

The influence of either effect may depend on the time that has lapsed since the program began operation. If a cash transfer program leads to an increase in investment, it may induce a multiplier effect that significantly raises household income. In this case, the demand for normal goods such as food, education and health will increase and may reach the level of demand induced by the certain conditions. Thus a program like PROCAMPO that is linked to agricultural production and agricultural spending may, over time, mirror the outcomes of a program like PROGRESA that requires school enrolment.

A key question then is whether PROCAMPO and PROGRESA are likely to lead to changes in spending and induce a multiplier effect that increases income. In understanding whether cash transfers induce investment an important consideration is the functioning of the credit market – and the role transfers can serve to relax credit constraints. Sadoulet, et al, (2001) note that ejido (or land reform) households in rural Mexico face a severe credit crunch. This is due to the general scarcity

of credit for agriculture in Mexico, as well as the particular inability of ejido households to use land as collateral given the incomplete nature of property rights in the ejido sector. In this context, cash transfers to ejido households – who make up the majority of PROCAMPO beneficiaries – may serve as a vehicle for overcoming credit market failure. Similarly, PROGRESA households, who are poor and likely to have limited collateral, may also have restricted credit access and cash transfers may serve to overcome credit constraints. Furthermore, in general, access to cash transfers provides a constant and secure flow of income which encourages households to invest in higher risk and higher return investment if credit and insurance markets do not function (Cord and Wodon, 1999). As a result, cash transfers may lead to larger income gains in the medium-term, which in turn can lead to higher investment in human capital through a pure income effect.

In the same manner that conditionality may influence expenditure, schooling and health outcomes, conditionality may also influence the allocation of investment spending. This is particularly the case if the conditions are linked to a particular asset as has been done with PROCAMPO. Since PROCAMPO is linked to land use, both past and present, investment may be biased towards agricultural uses rather than non-agricultural activities. PROCAMPO recipients may then not allocate financial resources in the most efficient manner; that is, toward the highest return activity in the absence of conditions.

B. Eligibility: Gender-targeting
A complicating factor in comparing the selected transfer schemes relates to the eligibility requirements of each program. As noted above, PROGRESA benefits are gender-targeted with transfers generally going to the mother, or responsible female adult, of the family. PROCAMPO, on the other hand, is geared towards farmers which results in males being the primary recipients of the cash transfers. In our sample, 98.6 percent of PROGRESA beneficiaries are women, while 91.8 percent of PROCAMPO beneficiaries are men.

This design feature of PROGRESA is based on an extensive empirical literature that attempts to relate household budget outlays to the asset or income share of women, or to the relative bargaining power of males and females in the household. Studies that have focused on the gender share of income or relative asset position of women in the household have come to clear conclusions about household expenditures. For example, Hoddinott and Haddad (1995) show evidence that in Cote d'Ivore increasing the share of cash income to women increases the budget share of food expenditures and reduces the budget shares of alcohol and cigarettes expenditures. Thomas (1997) for Brazil shows that more income under the control of women leads to greater health- and nutrition-related expenditures. To examine the importance of the asset position, or bargaining power, of women in the household, Quisumbing and Maluccio (2000) look at evidence from four countries: Bangladesh, Indonesia, Ethiopia and South Africa. Results from expenditure share regressions indicate that more assets in the hands of women increased the budget shares for education. Duflo's (2000) examination of South Africa's pension program deals directly with gender and cash transfer programs. The results of the analysis suggest that pensions received by women had a large impact on the anthropometric status of girls, specifically their granddaughters. In contrast, no effect on the nutrition status of household children is found for pensions received by men.

Taken together these results suggest that women are more likely than men to spend income on food (nutrition), health and education of their children (and grandchildren) than men. This complicates our analysis since this means that differences in household behavior across programs may not be entirely due to program conditionality but also to gender-targeting. However, if the programs are

found to result in similar outcomes, this suggests that neither the conditionality nor the eligibility requirements matter. We return to this issue when discussing our empirical findings below.

C. Hypothesis tests

Our main objective is to see whether the behavioral responses differ across two distinct conditional transfer programs. By definition a conditional transfer program should induce an immediate response on the part of beneficiaries provided the transfer is infra-marginal. In the context of the PROGRESA and PROCAMPO programs if conditionality matters, we would therefore expect a significant difference in the marginal effects of an additional peso from these two sources, with the marginal propensity to consume (MPC) out of a PROGRESA peso likely to be higher for food, health, and education, and that out of PROCAMPO higher for productive investment. One of our main hypotheses therefore is to confirm this difference in the MPC out of PROGRESA and PROCAMPO transfers. In light of the empirical evidence suggesting that transfer income in the hands of men is more likely to be 'wasted' on alcohol or tobacco, we also investigate whether the MPC is more family oriented for PROGRESA income (which is female controlled) and more adult oriented for PROCAMPO income (which is male controlled).

In addition to examining the marginal effect of PROGRESA and PROCAMPO, we can also examine the average effect of each program across recipient households. While the former examines the impact of an additional transfer peso from each program the latter examines the *average* impact of the transfer programs. Our objective here is to see if these two different programs lead to significant overall differences in the average level of key outcome indicators such as investment, consumption, and schooling. We are particularly interested in measuring whether a production based program can, in the medium term, mirror the short-term impact of a consumption based anti-poverty program. A companion paper (Ruiz, et al, 2002) using a similar framework compares the impact of the two programs on food security indicators.

Since cash transfers may increase investment and thus income in the medium and long-term, the influence of the program may change with time. Ideally, we would have sufficient data to look at the effects in the short-, medium- and long-term. However, that data is not currently available for such an evaluation for PROGRESA since the program has not operated for a sufficient amount of time. The available data can be used to evaluate whether investment has been influenced by PROGRESA but will not capture the multiplying effects of that investment. PROCAMPO on the other hand had been in operation for four years at the time of the survey and some medium-term multiplying effects may be evident. The comparison being made is thus between a short-term PROGRESA versus some mix of short and medium term PROCAMPO effects.

IV. Data

We use two primary sources of data for our empirical analysis. The first source of data is the census (ENCASEH) conducted in October 1997 in all communities selected for participation in PROGRESA and which formed the basis for the selection of beneficiary households. Since it covered all PROGRESA communities, including those households surveyed for the PROGRESA evaluation, the census serves as a baseline survey for this study.[4] Second, as part of an evaluation

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[4] A baseline household survey (ENCEL98M) was carried out in both the treatment and control communities in March, 1998, prior to the initiation of PROGRESA payments in May, 1998. The first ENCEL did not collect demographic,

based on an experimental design, 506 PROGRESA communities were selected and randomly allocated into treatment and control groups. Only households in the treatment communities received PROGRESA. The random assignment of localities allows for a more rigorous evaluation of PROGRESA and ensures that there is only a limited probability that differences between treatment and control groups are due to unobserved factors (see Behrman and Todd, 1999). As part of this evaluation, a follow-up survey (ENCEL98O) was conducted in these selected communities in October 1998.[5] Thus, our study is based on the 1997 ENCASEH and 1998 ENCEL98O surveys.

The ENCEL surveys collected data on all households in the 506 communities, both treatment and control, numbering over 24,000 households in total. We focus our attention on families originally classified as poor. Initially, PROGRESA classified as eligible about 52 percent of households. Afterward, due to perceived bias against certain kinds of poor households (especially elderly with no children), criteria of eligibility were revised and the program was extended to cover 78 percent of households. This expansion is known as "densification". Because of the revision of the criteria of eligibility, households included in the second phase have different characteristics. As these households were declared eligible later, most of them started receiving cash transfers some time after the initial households, so that the impact of PROGRESA on their consumption could be different. Hence, we restrict our analysis to the "pre-densification" poor (12,627 households). The ENCEL data set also collected information on whether the household received PROCAMPO benefits, and if so, the value of these benefits. Note that by October 1998 PROCAMPO households in the ENCEL survey would have been in that program for over four years; as discussed earlier, we therefore expect that some multiplier effect of PROCAMPO will have been realized by this time.

V. Empirical Approach

A. Total per capita consumption expenditure
In order to analyze the effect of PROGRESA and PROCAMPO transfers, we begin by estimating total consumption expenditures per capita[6] to determine the overall impact of the programs on household consumption. Total consumption expenditure is a function of non-transfer income, PROGRESA and PROCAMPO transfer income and preferences. While data on non-transfer income is available in the data set, it is endogenous and contains substantial measurement error. One way to deal with this problem would be to use instrumental variables, but since our interest lies in comparing the effects of PROGRESA and PROCAMPO on total expenditure, including non-transfer income in the regression is not necessary. We therefore choose to include directly in the regression the set of exogenous variables that would be used to explain non-transfer income.[7] These variables include measures of human capital and other household assets as well as regional dummies, which control for regional differences in the ability to generate income that are due to differences in infrastructure, public services, etc. A number of these variables, particularly age and gender of the head of household, whether the household is indigenous and education levels, may also reflect differences in preferences across households. However, distinguishing the effects of

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labor use, and asset information available in ENCASEH, and instead focused on household consumption. We thus use ENCASEH as the source for control variables.

[5] Following the 1998 surveys two additional ENCEL surveys were conducted in March and October 1999. Results from the evaluation of PROGRESA show that the main impact of PROGRESA in terms of schooling, health, and consumption is found after the initial 6 months of the program (October 1998). After that, the impact does not increase and, in fact, in some cases is reduced. Thus we only use the first round and not subsequent rounds.

[6] We use per adult equivalents based on the caloric consumption needs of different demographic categories, with values obtained from Instituto Nacional de Nutricion (1987).

[7] In effect, we are reducing the number of equations in our system by substituting the non-transfer income equation into the expenditure equation.

non-transfer income and preferences on total consumption expenditure is not the main concern of this study and the specification is therefore sufficient to meet our needs. Note that all these variables come from the baseline survey (ENCASEH) – with the exception of land[8] – in order to ensure the exogeneity of these variables, while the expenditure and transfer data come from the subsequent survey. The estimated equation can be expressed as follows:

$$(1) \ C_i = b_0 + b_1 * PROGRESA_i + b_2 * PROCAMPO_i + b_3 * X_i + u_i$$

where C_i represents monthly per capita total consumption expenditure of the ith household; $PROCAMPO_i$ and $PROGRESA_i$ are monthly per capita payments from the two transfer programs, X_i is a vector of socio-economic characteristics of household i, and u_i is the error term. To determine if the impact of a PROGRESA peso is different from a PROCAMPO peso we test whether b_1 is equal to b_2.

B. Expenditure and budget shares by category
The estimation of equation 1 provides information on the overall impact of the transfer programs on expenditure. As noted earlier, however, the design of the two programs may lead to differences in the way income is allocated across consumption expenditure categories affecting both the level of expenditure and the expenditure share across categories. To examine this hypothesis, two additional sets of regressions are run. First, we examine the effect of the programs on household consumption expenditure across seven categories: food, school expenses, health and hygiene, children clothes, adult clothes, energy and other goods. The expectation is that the programs will have a positive effect on all categories but that the effect might differ across program. The specification of the model is the same as in equation 1 with the dependent variable changed to be the expenditure in the particular category as follows:

$$(2) \ C(j)_i = b_0 + b_1 * PROGRESA_i + b_2 * PROCAMPO_i + b_3 * X_i + u_i$$

where $C(j)_i$ is the expenditure on good j by household i. Second, we examine consumption expenditure shares across the seven categories. While equation 2 considers the effect of the transfer programs on the level of expenditure for the category, the share equations examine how the transfer programs affect income allocation. Since PROGRESA is generally directed to women and is conditioned on education and health outcomes, and PROCAMPO is generally directed to men and conditioned on agricultural production, the expectation is that PROGRESA will lead to a shift in resource allocation towards consumption categories such as food, school expenses and health and hygiene while PROCAMPO will have no effect or will lead to a shift towards other goods. The specification of the model is the same as in equation 2:

$$(3) \ SC(j)_i = b_0 + b_1 * PROGRESA_i + b_2 * PROCAMPO_i + b_3 * X_i + u_i$$

where $SC(j)_i$ is the expenditure share on good j by household i.

C. Productive and human capital investments
The next stage of analysis is to examine the specific outcomes that are associated with each of the transfer programs. Both programs involve cash transfers, but PROCAMPO is directed towards households with a specific productive asset – agricultural land – and is conditioned on continued agricultural production, and the PROCAMPO message is one of spending on productive activities.

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[8] Data on land is taken from ENCEL98O since the land variable in ENCASEH was collected with no decimal digits, which resulted in all small parcels being recorded as measuring one hectare.

Despite the fact that PROCAMPO transfer levels are delinked from current production choices, PROCAMPO is expected to have a positive effect on agricultural spending. On the other hand, PROGRESA is thought to have less of an impact on capital accumulation and investment (putting aside the very long term accumulation of human capital), since it is given to household members who do not typically own productive assets – in particular women. To explore this, data on expenditures for agriculture and business (non agriculture) are used. Given the nature of the data collected, we consider all recurrent business expenditures as "investment." Since a number of households do not spend any income on these activities, the data is censored at zero and a Tobit model is appropriate. The equation is specified as follows:

$$(4)\ INV_i = b_0 + b_1*PROGRESA_i + b_2*PROCAMPO_i + b_3*X_i + u_i$$

where INV_i is investment by household i. This model is estimated for total investment, agricultural investment and business investment.

Turning to the requirements of PROGRESA, we want to look at whether PROGRESA has had a different impact on schooling and health outcomes than PROCAMPO. Equations 2 and 3 examine how PROGRESA and PROCAMPO transfers changed the level and share of expenditure on schooling and health. With the available data, it is also possible to directly analyze school enrolment and use of medical services by households. Since the available data on school enrolment and use of medical services is binary (1 if enrolled/used medical service and 0 otherwise), a discrete dependent variable model is appropriate and in this case a Probit model is used. The determinants of the probability of school enrolment and use of medical services by a child are expected to include non-transfer income, transfer income, preferences and child characteristics. As with the previous equations, non-transfer income and preferences are proxied in the estimation using household characteristics. The following equation is then estimated at the individual level, using data only for those families with children in the relevant age range:

$$(5)\ P(HC_{j,i}) = b_0 + b_1*PROGRESA_i + b_2*PROCAMPO_i + b_3*X_i + b_4*Z_{j,i} + u_{j,i}$$

where $HC_{j,i}$ is a dummy for either medical check-up or school enrolment of child j in household i and $Z_{j,i}$ is a vector of individual characteristics of child j in household i, such as individual age and gender. The standard errors in these Probit models are adjusted to account for the potential correlation among children who reside in the same household.

D. Average effects
In addition to testing whether the MPC out of transfer income is different across the programs, we also want to test whether on average, PROCAMPO has elicited the same level of demand for food, education, and health as PROGRESA even though this was not necessarily the precise objective of the PROCAMPO program. To do this, we simply repeat the regressions described above for total consumption expenditure, food expenditure and schooling and health outcomes, and include dummy variables to indicate PROGRESA or PROCAMPO households (instead of the value cash transfers received). The pairwise test of equality of the coefficients of the two dummy variables will tell us whether the actual level of consumption of these goods is the same across the two types of households. One complication in following this procedure is the presence of households that receive both PROCAMPO and PROGRESA which makes it difficult to identify clear PROCAMPO and PROGRESA effects. To solve this problem, we divide the households into four household groups Group 1: PROGRESA and PROCAMPO recipients (19 percent of the sample), Group 2: PROGRESA recipients only (44 percent), Group 3: PROCAMPO recipients only (10 percent), and

GROUP 4: non-recipients (27 percent). Dummy variables for each of the categories (with non-recipients as the base category) are created as follows for total consumption:

$$(1') \; C_i = b_0 + b_1 * PROGDUM_i + b_2 * PROCDUM_i + b_3 * PGPCDUM_i + b_4 * X_i + u_i$$

where $PROGDUM_i$, $PROCDUM_i$ and $PGPCDUM_i$ are, respectively a dummy variable for PROGRESA participation only, dummy variable for PROCAMPO participation only and a dummy variable for participation in both programs. Similar models are developed for food consumption expenditures (equation 2') and schooling and health participation (equation 5').

E. Value of transfers
An important issue to consider is the inclusion of data on the value of transfer payments in the regressions. Both PROCAMPO and PROGRESA cash transfers are reported in the surveys. While participation in PROGRESA is randomized at the locality level, the data suggest that a number of households receive a level of PROGRESA transfers that are less than that dictated by their eligibility. This difference is mostly due to administrative delays or mistakes, rather than the household choosing not to complete all program requirements since program uptake and compliance is well over 90 percent. Tominimize possible bias due to reporting error or selective administrative failures, we instrument the PROGRESA transfer amount using the intent to treat (ITT), which is the theoretical amount that should be paid to households that are entitled to participate in the program (details of this procedure are presented in Appendix I). As such, ITT is a good predictor of actual receipts and is exogenous to the system (Bloom, 1984).

The data on the PROCAMPO transfer are more problematic. Like PROGRESA, transfer receipts from PROCAMPO reported in the data do not always correspond exactly to household eligibility criteria. Here the situation is worse, since we do not have information on the characteristics for 1991-1993, when eligibility for PROCAMPO was established. Further, since participation in PROCAMPO is not randomized in this sample, bias may be introduced into the estimation by the fact that households choose to participate (selection bias) or by the design of the program (program placement bias). This suggests that even if an ITT predictor could be created there is still a possibility that PROCAMPO transfers are endogenous. We deal with this problem using instrumental variables to predict the value of PROCAMPO transfers, using instruments that are exogenous and correlated with PROCAMPO transfers but not correlated with the error term in the main equation. Instruments include the non-self cluster mean of PROCAMPO transfers in each locality and household productive assets such as the number of agricultural work animals. Details of the instruments used and tests of the validity of the instruments (over-identification tests) are presented in Appendix I.

We also perform a test suggested by Hausman (1978, 1983) to determine if PROCAMPO transfers are exogenous. The test requires predicting PROCAMPO transfers, obtaining the residuals, and including the residuals in the main regression. If the residuals are significant the hypothesis of exogeneity is rejected. In general the hypothesis of exogeneity is not rejected, suggesting that the standard regression model is appropriate. We present results for both the standard model and the IV model as well as the results of the endogeneity tests, and focus discussion on the appropriate model as indicated by the results of the exndogeneity tests..

VI. Results

A. Summary statistics

Table 1 presents the distribution of households across the four categories mentioned above[9]. Households in groups 3 and 4 are considered poor by PROGRESA (and thus theoretically eligible) but are located in the control communities. Overall, 63 percent of the sample receives PROGRESA, 29 percent receive PROCAMPO and 73 percent receive at least one type of transfer.

Table 2 summarizes the data on expenditures, investment, cash transfers, household characteristics and regional differences that are used in the analysis. In the first column, data from the entire sample is presented while the remaining columns report the results for the four household categories. It is expected that PROGRESA (categories 1 and 2) and non-PROGRESA (categories 3 and 4) households will have similar characteristics, as treatment and control communities were chosen randomly. PROCAMPO participation is not randomly assigned in the survey so some differences between PROCAMPO (categories 1 and 3) and non-PROCAMPO (categories 2 and 4) are expected to emerge.

On average, households spend approximately 170 pesos per capita each month. Households that only receive PROGRESA have the highest level of consumption, and those who receive only PROCAMPO the lowest. Food expenditures are the single highest expenditure representing approximately 80 percent of total expenditures. Health expenditures are second followed by other expenditures and energy. As anticipated, investment is higher for PROCAMPO households than other households and, in particular, agricultural spending is much higher.

PROGRESA transfers are on average between three and four times greater than PROCAMPO transfers. For PROGRESA recipients, the transfer represents about 25 percent of total monthly expenditure while for PROCAMPO recipients the transfer represents less than 10 percent of total expenditure. For households who receive both types of transfers, the combination provides on average 34 percent of total expenditure. Both of these programs represent significant contributions to household income.

The PROCAMPO households, split into categories 1 and 3, appear to have different characteristics as compared to categories 2 and 4. PROCAMPO households depend on agricultural and livestock production for their livelihood; they have much larger land and livestock holdings; and they participate less in non-agricultural wage labor. On average, PROCAMPO households are larger than non-PROCAMPO households – one reason for their lower per capita levels of expenditure – and are further along in the life cycle, with older household heads. PROCAMPO households also have a higher share of speakers of an indigenous language. All four categories have similar levels of infrastructure such as electricity and pipe water, as well as dirt floors in their dwellings.

These results indicate that there are some differences between the PROCAMPO households and other households while PROGRESA households seem to be similar to non-participant households. While this should not be surprising given the sampling framework, it suggests care must be taken in evaluating the effects of PROCAMPO. It must also be kept in mind that these PROCAMPO households are not representative of PROCAMPO households nationwide, but instead poorer than average given the nature of the PROGRESA sample.

B. Marginal program effects on consumption

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[9] We restrict our analysis to the 11310 households with valid observations with respect to total consumption and PROCAMPO and PROGRESA transfers.

Table 3 presents the results of the regression on total consumption expenditure (equation 1) and each individual expenditure category (equation 2). Results for the model using actual PROCAMPO transfers (OLS – panel B) and instrumented PROCAMPO transfers (IV – panel C) are presented along with the results of the Hausman test of exogeneity (panel A). These latter results indicate that the IV estimates are preferred for schooling, children clothes and adult clothes and so we focus on these (preferred estimates are shaded). Table 3 also includes results of the test of the hypothesis that the PROGRESA and PROCAMPO coefficients are equal. Only the results for the transfer variables are presented – full results for a subset of regressions are available in Appendix II with the remainder available upon request from the authors.

The results in column (1) indicate that an additional PROGRESA peso leads to a 0.406 increase in total consumption expenditures while a PROCAMPO peso leads to a 0.702 increase in total expenditures. Both results are significantly different from zero, and although the point estimate of the MPC out of PROCAMPO is almost twice as large as that of PROGRESA, the test statistic and p-value indicate that the null hypothesis that the coefficients are equal cannot be rejected. The first conclusion that can be drawn is that the two programs have a similar effect on total consumption (although after different periods of maturation).

Table 3 also presents the results for seven separate consumption expenditure categories estimated in levels. Because of the importance of food for the nutrition of households and the fact that it makes up around 80 percent of total expenditures, we begin by examining total food expenditures. Both programs have positive and significant marginal effects on food consumption and the null hypotheses of equality of coefficients cannot be rejected (column 2).

Differences begin to emerge when we examine non-food expenditure categories. The marginal effect of PROGRESA is significantly larger than that of PROCAMPO in the case of school expenditures, and in fact the point estimate for PROCAMPO is negative and statistically significant (column 3). Based on these results and given that PROGRESA requires school attendance, the increase in school expenditures by PROGRESA recipients appears the result of project conditionality. The negative result for PROCAMPO could be due to the fact that agricultural intensification implied by PROCAMPO has led to greater demand for child labor and thus a reduction in school expenditures. This is explored further in the expenditure share and school enrolment results presented below. The other results indicate that the marginal impact of PROCAMPO is significantly larger than that of PROGRESA in the case of hygiene/health (column 5) and adult and children's clothing. The result for health and hygiene may be due to the fact that health care visits required by PROGRESA are subsidized. Neither program appears to significantly affect energy expenditures.

To further explore the effects of PROCAMPO and PROGRESA on consumption expenditure patterns, we examine the influence of transfers on the allocation of income across expenditure categories (equation 3). Table 4 summarizes results on the influence of the program transfers on expenditure shares and presents the results of tests of differences. The results indicate that PROGRESA recipients shift income towards children's clothing (column 3) and schooling (column 2), and that this additional expenditure comes at the expense of hygiene/health and energy expenditures which have negative coefficients. PROCAMPO transfers on the other hand lead to a shift towards children's clothing, health, and adult clothing and away from food and schooling. Furthermore, the PROCAMPO expenditure shift away from schooling is significantly different from PROGRESA (column 2 Panel C) as are the magnitude of the shift towards adult clothing, health/hygiene, and children's clothing (at 7% level of significance). The results lend support to the

view that transfer programs differ in their effects depending on the conditions and eligibility of the program. A transferred peso does not bring about the same outcome regardless of the program.

C. Marginal program effects on productive and human capital investment
We now move to estimating the investment equations (equation 4)--Table 5 summarizes the results for the estimation of total investment as well as agricultural and business (non-agricultural) spending. PROCAMPO transfers are positively and significantly associated with total investment and the coefficient on PROCAMPO is significantly larger than PROGRESA. The investment effect for PROCAMPO comes from a large increase in agricultural spending at the expense of non-agricultural investment. That is, PROCAMPO recipients appear to increase investment in total and to shift investment away from non-agricultural activities and towards agriculture. PROGRESA transfers have a positive and significant impact on non-agricultural investment, and this is significantly larger than PROCAMPO. PROGRESA leads to greater business investment.

Shifting to the direct outcomes anticipated from PROGRESA, we now look at school enrolment and the use of medical services (equation 5). Because of program design, we expect PROGRESA to have a large positive impact on school enrolment. The PROCAMPO effect is uncertain. As we discussed earlier, if money is spent on agricultural investment and this implies intensification of productive activities, it is possible that more child labor may be employed, with a reduction in school enrolment rates. However, it is also possible that investment returns, or even only the increase in income due to PROCAMPO cash transfers, allows the family to reduce the use of child labor, hence increasing school enrolment. Similarly for the use of medical services, because of program design we expect PROGRESA to have a positive impact on the probability of children using medical services. We expect this effect to be bigger than that of PROCAMPO, although PROCAMPO may also have a positive impact, as it increases the amount of resources available to the household, at least if part of the money is spent in consumption or in productive investment with positive rates of return.

Table 6 presents a summary of results for the Probit models—exogeneity tests indicate that the results in Panel A are preferred. These show that only PROGRESA leads to a significant increase in school enrolment, and the null hypothesis of equality can be rejected. The results are consistent with the earlier results suggesting that PROGRESA households increase expenditures in schooling. The results for the use of medical services again indicate that only PROGRESA leads to a significant increase in the use of medical services. The null hypothesis of equality of coefficients cannot be rejected, however. We note that the ratio of children who benefit from health check-ups is very high, around 90 percent. The health results confirm our earlier explanation that lower PROGRESA expenditures are due to the fact that health care is subsidized under the program.

D. Level or average effects
There are clear differences in the marginal effects of cash income from PROGRESA and PROCAMPO as we would expect given the structure of the two programs. Now we repeat some of the same regressions as above but using dummy indicators of program participation, as shown in equation (1') to see if the mean level of demand for these goods is the same. Since PROGRESA is randomly assigned, including the dummy variable in this manner is acceptable. For reasons explained earlier, this is not the case for PROCAMPO. Therefore, as above, participation in PROCAMPO is instrumented and tests for endogeneity used to instruct us on the preferred

estimates. Participation in PROCAMPO is estimated using a linear probability model which provides consistent estimates.[10]

Table 7 presents results for total consumption and total food consumption. Results for the model using actual PROCAMPO participation (OLS – panel B) and instrumented PROCAMPO participation (IV – panel C) are presented along with the results of the Hausman test of exogeneity (panel A)—the Hausman test suggests that the OLS results in Panle B are preferred. These indicate that the mean levels of both total and food consumption are not significantly different between PROGRESA and PROCAMPO households.

Before examining school outcomes it is first necessary to consider the schooling trends carefully. Table 8 reports the mean rates of enrolment for children age 10-15 in 1997 using the ENCASEH and ENCEL data sets, by type of household. The sixth column in the Panel A presents the first difference in enrolment rates for each group – the change in enrollment between 1997 and 1998. The top row indicates that there was in fact an overall decline in enrolment. Since we use the same cohort for 1997 and 1998 most of this decline can surely be attributed to normal school attrition rates that are linked to age. Panel B of this table presents the difference-in-differences, the change in enrolment of any one group in relation to the same change in another group. The first row of this bottom panel illustrates, for example, that enrolment among PROGRESA households was 6.2 percentage points higher than in PROCAMPO households over this time period – this represents the additional program 'impact' of PROGRESA over PROCAMPO assuming other household characteristics are the same. This suggests that PROGRESA reduced the normal attrition rate of school kids in this cohort.

Table 9 reports the coefficients of the 3 dummy variables for the regression predicting the probability of enrolment for children aged 8-20 (results of the full set of control variables are available upon request). The test for exogeneity is not rejected; the preferred estimates ar thus those in Panel A, and these indicate that in 1998, 4 years after the start of PROCAMPO, the enrolment rate among PROCAMPO households was significantly lower than that of PROGRESA households – Table 8 indicates a difference of approximately 6 percentage points for kids age 10-15.

Table 9 also reports the dummy coefficients of the regression predicting the probability of attending a preventive health check-up. In this case, the exogeneity test is rejected and so the IV estimates in Panel B are preferred; these are similar to those presented earlier when looking at the marginal effects. In this case, however, the null hypothesis of equality can be rejected, meaning that PROGRESA households have higher average use of health services then PROCAMPO households.

In summary, when we compare mean levels of total and food consumption, and demand for education and health care, we find significant differences for schooling and health. Children who live in PROCAMPO only households are significantly less likely to be enrolled in school than their counterparts who reside in PROGRESA households. Apparently, PROCAMPO has lead to convergence in outcomes in terms of food consumption, but not school enrolment and health care usage. Note, however, that when households receive both PROCAMPO and PROGRESA, the results are similar to those households that just receive PROGRESA.

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[10]   As Thomas et.al. (1992) and others have noted, the linear probability IV estimator of a dummy endogenous variable is both consistent and asymptotically more efficient than the analogous predictor derived from a probit regression.

VII. Conclusions and policy implications

The results of the analysis suggest that both programs boost total consumption expenditure and food expenditure and that there are no evident program differences for these two outcomes. This is an important result – two cash transfer programs, with different conditionality requirements have the same impact on total household welfare, as measured by consumption expenditures. This result becomes even more interesting when we consider the different conditions and eligibility requirements of each program. PROCAMPO transfers are linked to agriculture and primarily received by men, while PROGRESA transfers are linked to human capital investment and primarily received by women. Even though this is the case, there is little difference between the programs in terms of the impact on overall welfare.

Differences begin to emerge when considering expenditure on non-food items. The results vary by category both in terms of levels and shares. School expenditure levels and shares are greater for PROGRESA recipients, with PROCAMPO leading to a reduction in schooling expenditure levels and share; PROCAMPO recipients spend more on adult clothes and personal health and hygiene. The results suggest that a PROGRESA peso is spent differently from a PROCAMPO peso, and thus that program design does indeed induce short-term behavioral change at the household level. The specific impact of conditionality is also seen in PROGRESA's greater impact on school enrolment and health services usage.

PROCAMPO also leads to a significant increase in agricultural spending, though not non-agricultural investment, again suggesting that PROCAMPO transfers are not simply consumed immediately, and certainly not spent on drink and merriment as suggested by the literature on intrahousehold allocation. Thus, the conditionality placed on PROCAMPO appears to have an impact as well--while this is a positive result, it is not clear if PROCAMPO conditionality leads to an over investment in agricultural production. PROGRESA also leads to a significant increase in investment but this is solely in non-agricultural investment and not nearly to the degree of PROCAMPO. The results indicate that transfer programs can play an important role in inducing investment, but the type of investment is linked to program conditionality. Policy-makers should consider this role when designing cash transfer programs. One common criticism of the PROGRESA type programs is the lack of attention paid to promoting productive investment by recipients, who are often considered too poor to be able to invest. This view is contradicted by the results, which suggest that promotion of small scale investment among PROGRESA beneficiaries could help maximize the impact of cash transfers. This is a crucial policy lesson, which if capitalized could enhance women's empowerment through the building of productive assets.

In terms of human capital investment, our results indicate that PROCAMPO households are on par with PROGRESA households in all areas considered with the exception of school enrolment and health services usage. Specifically, after 4 years of program participating, PROCAMPO households display school enrolment rates that are significantly lower (by approximately 6 percentage points for kids age 10-15 years) than their counterparts who entered PROGRESA one year ago. In this respect, the 'conditional' aspect of PROGRESA's design is clearly working.

These results have a number of interesting implications for policy-makers. First, if the primary interest of policy makers is in increasing the level of total or food consumption for poor households in the short-term, conditionality may be unnecessary. That is, a cash transfer will bring about the same results regardless of the conditions, and the cost of maintaining such conditions will not be worthwhile. However, if policy-makers are interested in effects beyond the short-term, conditionality may be a useful instrument to bring about these outcomes. The conditions placed on

recipients will depend on the outcomes policy-makers deem the most valuable. Tying transfers to schooling and health outcomes appears to lead to greater investment for long-term gains while tying transfers to productive assets appears to enhance investment for medium-term benefits. An alternative to conditionality for promoting productive investment may be complementary actions that improve conditions for investment. Even without conditionality related to productive activity, PROGRESA has led to an increase in non-agricultural investment. This effect may be enhanced if investment conditions are improved.

VIII. References

Alderman, H and M. Garcia. (1994). "Food Security and Health Security: Explaining the Level of Nutritional Status in Pakistan, *EDCC*, 42: 485-507.

Beard, Nick & Alan Swinbank (2001) "Decoupled payments to facilitate CAP Reform," Food Policy, 26: 121-145.Behrman, J. and Todd, P. (1999) "Randomness in the Experimental Samples of PROGRESA," *Report submitted to PROGRESA*, Washington, DC: International Food Policy Research Institute.

Bloom, H. (1984). "Estimating the Effect of Job-training Programs, Using Longitudinal Data: Ashenfelter's Findings Reconsidered," *Journal of Human Resources* 19(4).

Casco Flores, A. (2001). "Gasto Publico para el Desarrollo Rural en Mexico: 1994-2000," Food and Agricultural Organization, Regional Office for Latin American and the Caribbean, August.

Cord, L. and Wodon, Q. (1999) "Do Mexico's Agricultural Programs Alleviate Poverty: Evidence from the Ejido Sector," *Government Programs and Poverty in Mexico: Background Paper #4,* Washington, DC: The World Bank.

Duflo, E. (2000) "Grandmothers and Granddaughters: Old Age Pension and Intra-household Allocation in South Africa," *Working paper* http://econ-www.mit.edu/faculty/eduflo/papers.htm, Cambridge: MIT.

Guyomard, Herve, et.al. (2000) "Impact of the 1996 US FAIR act on the CAP in the World Trade Organization Context: The Decoupling Issue," Food Policy 25:17-34.

Handa, S. (1996) " Expenditure Behavior and Children's Welfare: An Analysis of Female Headed Households in Jamaica," *Journal of Development Economics* 50(1996):165-187.

Harvey, David R. (1998) "The US Farm Act: Fair or Foul? An Evolutionary Perspective from East of the Atlantic. Food Policy 23:111-122.

Hausman, J. (1978). "Specification tests in econometrics". *Econometrica* 46: 1251-1278

Hausman J. (1983) "Specification and Estimation of Simultaneous Equations Models," in Z. Griliches and M. Intriligator, eds., Handbook of Econometics, Amsterdam: North Holland.

Hoddinott, J. and Haddad, L. (1995) "Does Female Income Share Influence Household Expenditure? Evidence from Cote d'Ivoire," *Oxford Bulletin of Economics and Statistics* 57(1):77-96.

Instituto Nacional de Nutricion (1987). "Valor nutritivo de los alimentos Mexicanos. Tablas de uso practico," Mexico City: Instituto Nacional de Nutricion.

Martinez, J. (1999) "Programa de Apoyo al PROCAMPO," Mimeo, Washington, DC: Inter-American Development Bank.

OECD (2000) Decoupling: A Conceptual Overview. OECD Committee for Agriculture.

http://www.olis.oecd.org/olis/2000doc.nsf/LinkTo/com-agr-apm-td-wp(2000)14-final.

PROCAMPO, 2001. "PROCAMPO más humano," Abril.

PROGRESA (1998) *Metodologia para la Identificacion de los Hogares Beneficiarios del PROGRESA*, Mexico: PROGRESA.

Quisumbing, A. and Maluccio, J. (2000) "Intrahousehold Allocation and Gender Relations: New Empirical Evidence from Four Developing Countries," *FCND Discussion Paper No. 84,* Washington, DC: International Food Policy Research Institute.

Ruiz Arranz, M., Davis, B., Stampini, M., Winters, P. and Handa, S. (2002). "More calories or more diversity? An econometric evaluation of the impact of the PROGRESA and PROCAMPO transfer programs on food security in rural Mexico," Mimeo, Harvard University, FAO, Scuola Sant'Anna, Pisa, University of New England, and IDB.

Sadoulet, E., de Janvry A. and Davis, B. (2001) "Cash Transfer Program with Income Multiplier: PROCAMPO in Mexico," *World Development* 29(3), March.

SAGAR (Ministry of Agriculture, Livestock and Rural Development) (1998) "PROCAMPO, 1994-1998," *Claridades Agropecuarias* 64, December.

Skoufias E., Davis B, and S. de la Vega. (2001) "Targeting the Poor in Mexico: An Evaluation of the Selection of Households into PROGRESA," *World Development* 29(10), October.

Skoufias, E. and McClafferty, B. (2001) "Is PROGRESA Working? Summary of the Results of an Evaluation by IFPRI," *FCND Discussion Paper No. 118,* Washington, DC: International Food Policy Research Institute.

Thomas, D. (1997) "Incomes, Expenditures and Health Outcomes: Evidence on Intrahousehold Allocation," in Haddad, L., Hoddinott, J. and Alderman, H. (eds.) *Intrahousehold Resource Allocation in Developing Countries*, Baltimore: Johns Hopkins University Press for IFPRI.

Thomas, D., J. Strauss, & M.H Henriques (1992) "How Does Mother's Education Affect Child Height? Journal of Human Resources 26(2):183-201.

Table 1. Distribution of households among program categories

Number of obs=11,310
 (in percent)

	PROGRESA	NON PROGRESA	Total
PROCAMPO	19	10	29
NON PROCAMPO	44	27	71
Total	63	37	100

Table 2 – Mean Household Characteristics

	All	PC & PG	PG only	PC only	None
Number of observations	11310	2141	4942	1110	3117
Consumption (monthly 1997 pesos per-capita)					
Total consumption	171	171	178	160	162
Food consumption	136	136	143	126	130
School expenses	3	3	3	3	3
Children clothes	3	4	4	3	3
Health	13	13	13	14	13
Energy	6	5	6	5	6
Adult clothes	2	3	3	3	2
Other goods	7	7	7	7	7
Investment (monthly 1997 pesos per-capita)					
Total investment	7	15	5	11	5
Agricultural investment	5	10	4	10	3
Non agricultural investment	2	4	1	1	2
Transfer (monthly 1997 pesos per-capita)					
PROGRESA transfer	26	42	41	0	0
PROCAMPO transfer	4	13	0	15	0
Percentage of households by geographic distribution					
Region 3 - Sierra Negra-Zongolica-Mazateca	.13	.12	.12	.14	.14
Region 4 - Sierra Norte-Otomí Tepehua	.18	.12	.21	.13	.22
Region 5 - Sierra Gorda	.43	.45	.41	.46	.43
Region 6 - Montaña (Guerrero)	.11	.13	.12	.09	.08
Region 12 - Huasteca (San Luis Potosi)	.01	.01	.01	.02	.02
Region 27 - Tierra Caliente (Michoacan)	.12	.11	.12	.12	.12
Region 28 - Altiplano (San Luis Potosi)	.02	.06	.01	.04	.01
	All	PC & PG	PG only	PC only	None
Household characteristics (1997, unless indicated)					
Size of the household	5.94	6.47	5.69	6.58	5.76
Age of head	42.41	44.95	41.10	45.84	41.50
Male head	.92	.94	.91	.94	.91
Head speaks indigenous language	.43	.48	.41	.50	.41
Dirt floor	.75	.72	.75	.74	.76
Pipe water	.04	.05	.04	.04	.04
Electricity	.59	.61	.56	.65	.59
Size irrigated land in October 98	.05	.11	.03	.09	.02
Size rainfed land in October 98	1.39	2.43	.95	2.66	.94
N. cows	.61	.98	.44	1.08	.47
Share of adults employed for wage in agriculture	.16	.14	.17	.17	.17
Share of adults employed for wage, not in agriculture	.03	.02	.03	.02	.03
Dummy: ejido	.10	.20	.07	.18	.06

Table 3: Estimated Impact of Additional Peso on Total Consumption and Components: Consumption measured in levels

	TOTAL	FOOD	SCHOOL EXPEND.	CHILDREN CLOTH	HYGIENE	ENERGY	ADULT CLOTH	OTHER GOODS
PANEL A – HAUSMAN TEST	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Residual	-0.162	-0.067	0.108***	-0.103***	-0.060	-0.061	-0.069*	0.098
	(0.851)	(0.913)	(0.008)	(0.007)	(0.761)	(0.430)	(0.064)	(0.270)
Observations	11076	11167	11178	11190	11171	11193	11189	11186
R-squared	0.240	0.214	0.062	0.113	0.094	0.187	0.043	0.033
PANEL B - OLS								
PROCAMPO	0.702***	0.386***	0.002	0.014**	0.222**	0.013	0.027*	0.033
	(0.005)	(0.008)	(0.840)	(0.029)	(0.020)	(0.297)	(0.058)	(0.166)
PROGRESA	0.406***	0.355***	0.016***	0.022***	0.012	0.006	0.004	0.002
	(0.000)	(0.000)	(0.001)	(0.000)	(0.254)	(0.345)	(0.297)	(0.831)
Observations	11089	11180	11191	11203	11184	11206	11202	11199
R-squared	0.240	0.214	0.061	0.111	0.094	0.187	0.043	0.033
TEST PROC=PROG - Prob>F	0.25	0.85	0.10	0.24	0.03	0.60	0.10	0.20
PANEL C - IV								
PROCAMPO	0.858	0.450	-0.101**	0.111***	0.280	0.071	0.093**	-0.059
	(0.361)	(0.499)	(0.018)	(0.005)	(0.200)	(0.376)	(0.033)	(0.538)
PROGRESA	0.407***	0.355***	0.016***	0.022***	0.013	0.006	0.004	0.001
	(0.000)	(0.000)	(0.002)	(0.000)	(0.255)	(0.320)	(0.242)	(0.880)
Observations	11076	11167	11178	11190	11171	11193	11189	11186
R-squared	0.240	0.214	0.047	0.081	0.093	0.182	0.033	0.031
TEST PROC=PROG - Prob>F	0.63	0.89	0.01	0.02	0.21	0.42	0.04	0.53

Robust p values in parentheses   * significant at 10%; ** significant at 5%; *** significant at 1%

Dependent variables: per-capita consumption (total and categories). PROCAMPO and PROGRESA are monthly per-capita transfers (monetary values). Control variables included demographic and housing characteristics, regional location, and land and labor assets. PANEL A shows the result of the Hausman test of exogeneity (see text for details); PANEL B reports OLS estimates; PANEL C presents results of Instrumental Variable estimation. Non-self cluster mean of PROCAMPO transfer and number of work animals in 1997 are used as instruments. Overidentification tests of the restrictions are always performed and passed. Preferred estimates are shaded (in grey) based on result of the exogeneity test.

Table 4: Estimated Impact of Additional Peso on Total Consumption and Components: Consumption measured in shares

	FOOD	SCHOOL EXPEND.	CHILDREN CLOTH	HYGIENE	ENERGY	ADULT CLOTH	OTHER GOODS
PANEL A – HAUSMAN TEST							
Residual	-0.007	0.059***	-0.041**	0.006	-0.005	-0.023*	0.011
	(0.939)	(0.002)	(0.020)	(0.879)	(0.867)	(0.092)	(0.789)
Observations	11076	11076	11076	11076	11076	11076	11076
R-squared	0.118	0.080	0.120	0.034	0.177	0.038	0.018
PANEL B - OLS							
PROCAMPO	-0.044*	-0.003	0.005**	0.027*	-0.003	0.007**	0.010
	(0.052)	(0.325)	(0.029)	(0.054)	(0.509)	(0.018)	(0.178)
PROGRESA	-0.006	0.006**	0.011***	-0.007**	-0.002	0.000	-0.002
	(0.405)	(0.018)	(0.000)	(0.046)	(0.334)	(0.851)	(0.575)
Observations	11089	11089	11089	11089	11089	11089	11089
R-squared	0.118	0.079	0.119	0.034	0.177	0.038	0.018
TEST PROC=PROG - Prob>F	0.12	0.03	0.04	0.02	0.85	0.04	0.16
PANEL C - IV							
PROCAMPO	-0.038	-0.059***	0.044**	0.021	0.002	0.029**	0.000
	(0.674)	(0.004)	(0.018)	(0.607)	(0.951)	(0.037)	(0.997)
PROGRESA	-0.006	0.005**	0.011***	-0.007**	-0.002	0.000	-0.002
	(0.407)	(0.023)	(0.000)	(0.043)	(0.341)	(0.747)	(0.564)
Observations	11076	11076	11076	11076	11076	11076	11076
R-squared	0.118	0.059	0.099	0.034	0.177	0.029	0.017
TEST PROC=PROG - Prob>F	0.72	0.00	0.07	0.50	0.90	0.04	0.96

Robust p values in parentheses   * significant at 10%; ** significant at 5%; *** significant at 1%

Dependent variables: per-capita consumption (total and categories). PROCAMPO and PROGRESA are monthly per-capita transfers (monetary values). Control variables included demographic and housing characteristics, regional location, and land and labor assets. PANEL A shows the result of the Hausman test of exogeneity (see text for details); PANEL B reports OLS estimates; PANEL C presents results of Instrumental Variable estimation. Non-self cluster mean of PROCAMPO transfer and number of work animals in 1997 are used as instruments. Overidentification tests of the restrictions are always performed and passed. Preferred estimates are shaded (in grey) based on result of the exogeneity test.

Table 5: Tobit IV Estimates of Impact of Additional Peso on Investment Spending

	AGRIC.	NON-AG.	TOTAL
PROCAMPO	1.514***	-5.253**	2.273***
	(0.000)	(0.019)	(0.000)
PROGRESA	0.026*	0.265	0.057**
	(0.062)	(0.106)	(0.027)
Observations	9988	9988	9988
TEST PROC=PROG Prob>F	0.00	0.01	0.00

p values in parentheses   * significant at 10%; ** significant at 5%; *** significant at 1%
Dependent variables: Monetary value of agricultural and non-agricultural spending. PROCAMPO and PROGRESA are monthly per-capita transfers (monetary values). Non-self cluster mean of PROCAMPO transfer and the amount of forest land utilized in 1997 are used as instruments.

Table 6: Probit Coefficient Estimates of Impact of Additional Peso on Human Capital Outcomes

Dependent variable:	SCHOOL ENROLMENT	HEALTH CHECK-UP
PANEL A – PROBIT	(1)	(2)
PROCAMPO	.0009	.0026
	(.645)	(.636)
PROGRESA	.0044***	.0078***
	(.000)	(.000)
TEST PROC= PROG– Prob> F	.098	.376
PANEL B – IVPROBIT		
PROCAMPO	.0131	.0131
	(.260)	(.260)
PROGRESA	.0078***	.0078***
	(.000)	(.000)
TEST PROC= PROG– Prob> F	.648	.648
Exogeneity test – P value	.576	.335
Observations	21709	6160
R-square	.572	.104

p values in parentheses   * significant at 10%; ** significant at 5%; *** significant at 1%
Dependent variables: school enrolment of family members aged 8 to 18 and medical check-up of children aged 0 to 5. PROCAMPO and PROGRESA are monthly per-capita transfers (monetary values). PANEL A reports regular Probit estimates; PANEL B presents results of Instrumental Variable Probit estimation. Non-self cluster mean of PROCAMPO transfer and the amount of forest land utilized in 1997 are used as instruments. The p-value of the Smith-Blundell test of exogeneity of PROCAMPO is reported below. Preferred estimates are shaded (in grey) based on results of the exogeneity test.

Table 7: Estimated Impact of Program Participation on Total and Food Consumption Expenditure: Consumption measured in levels

	TOTAL	FOOD
PANEL A – HAUSMAN TEST		
Residual for PROCAMPO	-3.063	1.410
	(0.921)	(0.949)
Residual for PROCAMPO*PROGRESA	-28.236	-16.311
	(0.354)	(0.408)
Observations	11076	11167
R-squared	0.232	0.208
TEST e 0 - Prob>F	0.37	0.36
PANEL B – OLS		
PROCAMPO ONLY – Dummy	12.031**	8.033**
	(0.012)	(0.037)
PROGRESA ONLY – Dummy	14.294***	13.218***
	(0.001)	(0.000)
BOTH PROGRAMS – Dummy	20.815***	17.122***
	(0.000)	(0.000)
Observations	11089	11180
R-squared	0.230	0.207
TEST PROC=PROG - Prob>F	0.66	0.24
PANEL C – IV		
PROCAMPO ONLY – Dummy	16.787	-6.690
	(0.593)	(0.710)
PROGRESA ONLY – Dummy	22.305	9.605*
	(0.101)	(0.083)
BOTH PROGRAMS – Dummy	44.296	12.776*
	(0.129)	(0.051)
Observations	11076	11167
R-squared	0.226	0.206
TEST PROC=PROG - Prob>F	0.78	0.24

Robust p values in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.
Dependent variables: Monetary value of total and food consumption. PROCAMPO and PROGRESA are dummies for participation in the programs. Control variables included demographic and housing characteristics, regional location, and land and labor assets. PANEL A shows the result of the Hausman test of exogeneity (see text for details); PANEL B reports OLS estimates; PANEL C reports Instrumental Variable estimation results. Non-self cluster mean of PROCAMPO transfer and number of work animals in 1997 are used as instruments. Overidentification tests of the restrictions are always performed and passed. Preferred estimates are shaded (in grey) based on result of the exogeneity test.

Table 8 – Mean School Enrolment Rates for Children Age 10-15 in 1997 & 1998
Panel A – Enrolment ratio and differences

	N (1)	Enrolment 97 (2)	std err (3)	Enrolment 98 (4)	std err (5)	Difference 98-97 (6)=(4)-(2)
All	12862	.82289	.41055	.78541	.38178	-.03748
PROGRESA only	5116	.82701	.37827	.80805	.39387	-.01896
PROCAMPO only	1527	.81794	.38602	.73674	.44055	-.08121
Both	2857	.82814	.37732	.82394	.38094	-.00420
Neither	3362	.81440	.38884	.74033	.43852	-.07406

Panel B – Difference-in-differences

	DD	Std err	T-stat	P>|t|
Progresa vs Procampo	.06224	.016	3.84	.00
Progesa vs Both	-.01476	.013	-1.16	.24
Progresa vs Neither	.05510	.012	4.41	.00
Procampo versus Both	-.07700	.017	-4.39	.00
Procampo versus neither	-.00714	.018	-.39	.69
Both versus Neither	.06986	.014	4.87	.00

Std Err is the standard error of the statistic immediately to the left. DD is the double difference, obtained by subtracting the relevant rows in column (6) of Panel A. Both means household participates in both programs; neither means they participate in neither program. T-stat is the t-statistic for the test that the double difference is equal to 0.

Table 9: Probit Estimates of Impact of Program Participation on Human Capital Outcomes

	SCHOOL ENROLMENT	HEALTH CHECK-UP
PANEL A - PROBIT		
PROCAMPO ONLY – Dummy	-.0048	.2749***
	(.926)	(.006)
PROGRESA ONLY – Dummy	.2628***	.4881***
	(.000)	(.000)
BOTH PROGRAMS – Dummy	.3581***	.5247***
	(.000)	(.000)
TEST PROC= PROG– Prob> F	.000	.032
PANEL B - IVPROBIT		
PROCAMPO ONLY - Dummy	-.1667	.1540
	(.287)	(.595)
PROGRESA ONLY - Dummy	.2208***	.5841***
	(.001)	(.000)
BOTH PROGRAMS - Dummy	.3272***	.8842***
	(.003)	(.000)
TEST PROC= PROG– Prob> F	.000	.046
Observations	21709	6160
R-square	.5719	.114
Exogeneity test – P value	.313	.016

p values in parentheses   * significant at 10%; ** significant at 5%; *** significant at 1%
Dependent variables: school enrolment of family members aged 8 to 18 and medical check-up of children aged 0 to 5. PROCAMPO and PROGRESA are dummies for participation in the programs.
PANEL A reports regular Probit estimates; PANEL B presents results of Instrumental Variable Probit estimation. Non-self cluster mean of PROCAMPO transfer, the same mean times PROGRESA ITT and the number of work animals in 1997 are used as instruments. The p-value of the Smith-Blundell test of exogeneity of PROCAMPO and PROCAMPO*PROGRESA is reported below. Preferred estimates are shaded (in grey) based on result of the exogeneity test.

Appendix I. Creating the Procampo and Progresa transfer variables
[FOR BENEFIT OF REFEREES; CAN BE REDUCED IN FINAL VERSION]

A. PROGRESA Intent to Treat

PROGRESA is paid to all poor households in treatment communities. ITT is composed of a monthly contribution for every child enrolled in school, plus a fixed monthly payment. This part of the transfer is subject to a cap of 695 pesos per month. In addition, a contribution for school materials is granted once a year. Assuming no delayed enrollment, PROGRESA benefits begin at third grade, roughly at age 8. In principle, these benefits should stop at age 15, at the third year of secondary school, but the PROGRESA age-cap is 18, so the benefits granted to the third grade of secondary school are attributed to all the children aged 15 to 18. Benefits vary by age and gender of the child, from 60 to 225 pesos per month. In addition, 115 pesos per month are paid to all beneficiaries as the fixed payment. The yearly contribution for school materials amounts to 135 pesos for primary school and to 170 pesos for secondary. PROGRESA ITT is thus calculated according to the following equation:

$$
\begin{aligned}
\text{ITT (November 1997 pesos)} = \ & \min\{695, [(m8{+}f8)^*60 * (m9{+}f9)^*70 + (m10{+}f10)^*90 + \\
& (m11{+}f11)^*120 + (m12{+}m13)^*175 + (f12{+}f13)^*185 + (m14{+}m15)^*185 + (f14{+}f15)^*205 \\
& + (m16{+}m17{+}m18)^*195 + (f16{+}f17{+}f18)^*225 + 115]\} + \\
& (m8{+}m8{+}m10{+}m11{+}f8{+}f9{+}f10{+}f11)^*(135/12) + \\
& (m12{+}m13{+}m14{+}m15{+}m16{+}m17{+}m18{+}f12{+}f13{+}f14{+}f15{+}f16{+}f17{+}f18)^*(170/12)
\end{aligned}
$$

where mi is a dummy for the presence of a male child aged i, enrolled in school, and fi is the equivalent for a female.

B. PROCAMPO instrumental variables

Since PROCAMPO eligibility is based on land use we are concerned that the OLS estimator of PROCAMPO might be picking up the true program effect combined with a land effect, and therefore be biased.

However, we are confident that we are able to identify the two effects separately by adequately controlling for all relevant characteristics in the regression. In our sample, 93 percent of households which own or use land report growing staples (the crops that entitle eligibility for PROCAMPO). However, only 47 percent of them received PROCAMPO payments during the survey period.[11] Furthermore, about 10% of PROCAMPO recipients did not grow staples. This is possible because of a recent change of destination, for example toward authorized environmental programs, or towards a different kind of crop (10 percent of recipients). The following tables show the relationship between land ownership, PROCAMPO transfers and staples.

---

[11] It is entirely possible that households not reporting having received PROCAMPO may have received it in previous years. In fact, since technically households may not receive PROCAMPO for land left follow for a season, households may not receive PROCAMPO transfers every year. Obviously, the incentives exist to cheat or not leave land fallow.

Share of households	No staple	Staple	Total
Non PROCAMPO	43	28	71
PROCAMPO	3	26	29
Total	46	54	

Share of households	No staple	Staple	Total
With No land	42	0	42
With land	4	54	58
Total	46	54	

Index of correlation	Land ownership	PROCAMPO	Staples
Land ownership	1		
PROCAMPO	.46	1	
Staples	.92	.45	1

The tables point out that the data do not show a strong direct relationship between growing staples and being a beneficiary of PROCAMPO. Identification of the program effect is coming from all those households that are similar in all relevant characteristics to PROCAMPO recipients (and in particular, have the same type of land), but that do not get the cash transfer because they only obtained the PROCAMPO eligible-type of land after the eligibility roster was fixed, by either buying new land or changing crops. There might be a fraction of households out of these 53% that, despite being eligible, decided not to participate. This would introduce a self-selection bias in the estimation. However, our own knowledge of the program, and previous work on PROCAMPO (Sadoulet, et al, 2001) indicate that this group is likely to be very small among these poor households. We deal with the problem of potential endogeneity of PROCAMPO by performing instrumental variable estimation. Our procedure starts with the Hausman test of endogeneity in order to assess the existence of the problem. For each IV estimation the overidentifying restriction is tested (overid test). For instruments we use the non-self cluster mean of PROCAMPO transfers and number of oxen in 1997 or size of land set to forestry, always in 1997, the use of the last two depending on the results of the overid test. Non-self cluster means are proper instruments, in the sense that, by definition, they are uncorrelated with the error term, and are highly correlated with the instrumented variable (Alderman and Garcia, 1994; Handa, 1996). (Results are presented in Appendix II.)

Appendix II. Full results of selected auxiliary regressions

Table A2.1: Stage 1 Regression for Per-Capita PROCAMPO Transfer

Dependent Variable: PROCAMPO transfer, per-capita	Coefficient.	t-staistic.
Region 4 - Sierra Norte-Otomí Tepehua	-.325	-.89
Region 5 - Sierra Gorda	-.287	-.88
Region 6 - Montaña (Guerrero)	-.269	-.64
Region 12 - Huasteca (San Luis Potosi)	-.061	-.06
Region 27 - Tierra Caliente (Michoacan)	-.223	-.52
Region 28 - Altiplano (San Luis Potosi)	3.274	4.03
log of household size	-1.180	-3.27
Age of head	.023	1.93
Male head	.202	.46
Head speaks indigenous language	.490	2.17
Dirt floor	-.402	-1.67
Pipe water	.568	1.13
Electricity	.480	2.19
Size irrigated land in October 98	1.359	6.17
Size rainfed land in October 98	.491	15.99
Size of land for pasture in October 98	-.122	-.80
N. cows	.213	4.81
Children age 0-2, share	-12.121	-7.13
Children age 3-4, share	-12.186	-6.85
Children age 5-10, share	-12.377	-7.93
Males age 11-14, share	-13.588	-7.32
Females age 11-14, share	-13.763	-7.09
Males age 15-19, share	-14.222	-7.69
Females age 15-19, share	-11.544	-6.08
Males age 20-34, share	-14.409	-9.41
Females age 20-34, share	-8.858	-5.07
Males age 35-59, share	-5.989	-4.54
Females age 35-59, share	-11.600	-7.01
Females age>=60, share	-9.994	-6.28
Males with incomplete primary education, share	1.573	2.13
Males primary education, share	3.263	3.02
Males secundary education, share	2.721	1.44
Males high education, share	2.105	.44
Females with incomplete primary education, share	1.032	1.35
Females primary education, share	1.153	1.02
Females secundary education, share	1.209	.60
Females high education, share	-9.460	-1.61
Share of adults employed for wage in agriculture	-1.914	-2.70
Share of adults employed for wage, not in agriculture	-3.910	-2.91
Dummy: ejidatario	2.909	7.92
PROGRESA transfer, per-capita	-.002	-.66
PROCAMPO transfer per-capita, non-self cluster mean	.590	24.93
N. ox per-capita	-1.308	-1.38
Constant	11.941	7.44
N. observations	11076	
Adjusted R-squared	.18	

Table A2.2: Hausman Test of Exogeneity

Dependent Variable: total consumption, per-capita	Coefficient	t-staistic
PROGRESA transfer, per-capita	.858	.91
PROCAMPO transfer, per-capita	.407	4.30
Region 4 - Sierra Norte-Otomí Tepehua	1.634	.21
Region 5 - Sierra Gorda	-14.428	-1.99
Region 6 - Montaña (Guerrero)	-33.057	-3.40
Region 12 - Huasteca (San Luis Potosi)	-10.513	-.80
Region 27 - Tierra Caliente (Michoacan)	16.379	2.34
Region 28 - Altiplano (San Luis Potosi)	-31.168	-2.12
log of household size	-96.935	-20.57
Age of head	-.006	-.04
Male head	4.237	.86
Head speaks indigenous language	-17.268	-4.17
Dirt floor	-21.152	-7.66
Pipe water	.750	.17
Electricity	-2.670	-.81
Size irrigated land in October 98	8.626	2.55
Size rainfed land in October 98	2.316	2.21
Size of land for pasture in October 98	-3.858	-2.93
N. cows	1.106	1.65
Children age 0-2, share	109.147	4.58
Children age 3-4, share	53.437	2.25
Children age 5-10, share	29.348	1.26
Males age 11-14, share	-47.430	-1.86
Females age 11-14, share	-2.122	-.08
Males age 15-19, share	-33.461	-1.25
Females age 15-19, share	18.417	.71
Males age 20-34, share	-15.325	-.54
Females age 20-34, share	49.005	1.82
Males age 35-59, share	13.823	.65
Females age 35-59, share	63.424	2.20
Females age>=60, share	26.938	.84
Males with incomplete primary education, share	16.430	1.56
Males primary education, share	17.659	1.35
Males secundary education, share	-16.194	-.80
Males high education, share	153.468	2.60
Females with incomplete primary education, share	-10.918	-1.18
Females primary education, share	-2.853	-.24
Females secundary education, share	38.380	1.45
Females high education, share	28.339	.47
Share of adults employed for wage in agriculture	-12.641	-1.17
Share of adults employed for wage, not in agriculture	9.057	.59
Dummy: ejidatario	4.801	.96
Error term from first stage regression	**-.162**	**-.19**
Constant	316.239	11.07
N. observations	11076	
Adjusted R-squared	.24	

Table A2.3: Full OLS Regression Results for Per-Capita Total Consumption Expenditure: Consumption measured in pesos

Dependent Variable: total consumption, per-capita	Coefficient	t-staistic.
PROGRESA transfer, per-capita	.702	2.79
PROCAMPO transfer, per-capita	.406	4.32
Region 4 - Sierra Norte-Otomí Tepehua	1.515	.19
Region 5 - Sierra Gorda	-14.433	-1.99
Region 6 - Montaña (Guerrero)	-32.961	-3.37
Region 12 - Huasteca (San Luis Potosi)	-10.205	-.80
Region 27 - Tierra Caliente (Michoacan)	16.435	2.29
Region 28 - Altiplano (San Luis Potosi)	-29.309	-2.71
log of household size	-97.068	-20.76
Age of head	-.006	-.05
Male head	4.259	.86
Head speaks indigenous language	-17.166	-4.17
Dirt floor	-21.318	-7.84
Pipe water	.776	.18
Electricity	-2.592	-.78
Size irrigated land in October 98	8.845	2.90
Size rainfed land in October 98	2.402	2.85
Size of land for pasture in October 98	-3.889	-3.04
N. cows	1.158	1.86
Children age 0-2, share	107.630	4.33
Children age 3-4, share	51.317	2.13
Children age 5-10, share	27.666	1.17
Males age 11-14, share	-49.206	-1.95
Females age 11-14, share	-4.835	-.18
Males age 15-19, share	-35.576	-1.39
Females age 15-19, share	16.454	.61
Males age 20-34, share	-17.542	-.64
Females age 20-34, share	47.570	1.68
Males age 35-59, share	12.931	.60
Females age 35-59, share	61.416	2.03
Females age>=60, share	25.385	.76
Litered males, share	16.327	1.60
Males with incomplete primary education, share	17.957	1.43
Males primary education, share	-16.095	-.81
Males secundary education, share	153.565	2.60
Males high education, share	-10.755	-1.16
Females with incomplete primary education, share	-2.667	-.23
Females secundary education, share	38.489	1.46
Females high education, share	26.644	.45
Share of adults employed for wage in agriculture	-12.836	-1.19
Share of adults employed for wage, not in agriculture	7.994	.54
Dummy: ejidatario	5.279	1.12
Constant	318.617	10.89
N. observations	11089	
Adjusted R-squared	.24	
Test F: PROGRESA=PROCAMPO, P-value	.25	

Table A2.4: Full IV Regression Results for Total Per-Capita Consumption Expenditures: Consumption measured in levels

Dependent Variable: total consumption, per-capita	Coefficient	t-statistic
PROGRESA transfer, per-capita	.858	.92
PROCAMPO transfer, per-capita	.407	4.32
Region 4 - Sierra Norte-Otomí Tepehua	1.634	.21
Region 5 - Sierra Gorda	-14.428	-1.99
Region 6 - Montaña (Guerrero)	-33.057	-3.40
Region 12 - Huasteca (San Luis Potosi)	-10.513	-.80
Region 27 - Tierra Caliente (Michoacan)	16.379	2.34
Region 28 - Altiplano (San Luis Potosi)	-31.168	-2.12
log of household size	-96.935	-20.57
Age of head	-.006	-.04
Male head	4.237	.86
Head speaks indigenous language	-17.268	-4.17
Dirt floor	-21.152	-7.66
Pipe water	.750	.17
Electricity	-2.670	-.81
Size irrigated land in October 98	8.626	2.56
Size rainfed land in October 98	2.316	2.21
Size of land for pasture in October 98	-3.858	-2.93
N. cows	1.106	1.65
Children age 0-2, share	109.147	4.61
Children age 3-4, share	53.437	2.27
Children age 5-10, share	29.348	1.27
Males age 11-14, share	-47.430	-1.87
Females age 11-14, share	-2.122	-.08
Males age 15-19, share	-33.461	-1.26
Females age 15-19, share	18.417	.72
Males age 20-34, share	-15.325	-.54
Females age 20-34, share	49.005	1.84
Males age 35-59, share	13.823	.65
Females age 35-59, share	63.424	2.23
Females age>=60, share	26.938	.85
Males with incomplete primary education, share	16.430	1.57
Males primary education, share	17.659	1.35
Males secundary education, share	-16.194	-.80
Males high education, share	153.468	2.60
Females with incomplete primary education, share	-10.918	-1.18
Females primary education, share	-2.853	-.24
Females secundary education, share	38.380	1.45
Females high education, share	28.339	.47
Share of adults employed for wage in agriculture	-12.641	-1.17
Share of adults employed for wage, not in agriculture	9.057	.59
Dummy: ejidatario	4.801	.96
Constant	316.239	11.15
N. observations	11076	
Adjusted R-squared	.24	
Test F: PROGRESA=PROCAMPO, P-value	.63	
Test of overidentifying restrictions, P-value	.58	