Designing a new PROCAMPO program:

Lessons from OPORTUNIDADES

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EXECUTIVE SUMMARY

In the past two decades, the Mexican government has significantly changed its approach to rural development and poverty alleviation by moving away from price subsidies toward more directly targeted programs. The cash transfer programs PROCAMPO and OPORTUNIDADES have been key components of this overall policy shift. PROCAMPO, which provides cash to staple producers for potential losses due to NAFTA, is a central component of Mexican agricultural policy; OPORTUNIDADES, which provides cash to poor households conditional on human capital investment, is a central element of Mexican social policy. Given the Mexican government's recent announcement to extend PROCAMPO, it is worth taking stock of the lessons learned from the OPORTUNIDADES experience and to consider the program's relationship with PROCAMPO. The objective of this paper is to examine these two programs and, while considering overall rural development policy, to draw lessons for designing a new PROCAMPO program.

Evaluations of both PROCAMPO and OPORTUNIDADES indicate that the programs improve the welfare of recipient households in terms of consumption, income, dietary diversity, and caloric intake. Moreover, OPORTUNIDADES has also had an impact on human capital investment in terms of school enrolment and a variety of health outcomes. PROCAMPO does not appear to have had an impact on these outcomes. In fact, participating in PROCAMPO is associated with a lower incidence of health checkups, which is attributed to the higher shadow value of household labor in agricultural households.

In terms of agricultural and other productive activities, both PROCAMPO and OPORTUNIDADES appear to induce investment in productive activities by providing liquidity to rural households. The impact on agricultural spending is greater for PROCAMPO, which is not surprising since it is linked to land ownership and agricultural production. OPORTUNIDADES seems to have a greater impact on inducing entry into new agricultural and nonagricultural self-employment activities as compared to increasing the intensity of ongoing ones. Furthermore, the different impact on agricultural outcomes found across land-ownership categories for OPORTUNIDADES recipients and across a range of household characteristics (access to irrigated land, technical assistance, and credit) for PROCAMPO recipients indicate that households respond differently to incentives and that therefore, eligibility criteria are important.

While PROCAMPO does appear to induce greater agricultural spending, it does not seem to have significantly motivated farmers to transition away from producing maize and other staple goods. PROCAMPO recipients maintaining production practices could be motivated by concerns of the longevity of projects or the desire to stay in PROCAMPO to be eligible future programs. Even if the program is decoupled from present production the perception may be that continuing to produce program crops is the mostly like way to ensure future coverage. Furthermore, given the lack of complementary policies and the existence of targeted price subsidies which have provided incentives for remaining in maize, it is not too surprising that PROCAMPO recipients did not shift out of staple production. There may have been limited incentives and few

opportunities. In and of themselves, transfers may induce some spending and investment but may be insufficient to induce dramatic changes in farm production.

Finally, note that the experience of PROCAMPO and OPORTUNIDADES and the differences in the impacts of the programs as well as the analysis of related programs suggest that conditionality works as a mechanism to induce a behavioral response and that characteristics of recipients influence the significance and magnitude of outcomes—that is, conditionality and eligibility criteria matter. Furthermore, in the case of OPORTUNIDADES conditionality acts as a mechanism to induce better-off recipients to self select out of the program by creating a cost to program participation. Conditionality can play an important role in program targeting and given the OPORTUNIDADES experience, it is evident that while it comes with a cost, conditionality is administratively feasible in Mexico.

In general, Mexico's poverty-reduction efforts have focused on providing the poor with education and health services, which improve well-being and avoid the intergenerational transmission of poverty. There appears to be little emphasis on providing productive opportunities so that the current rural poor can achieve their own way out of poverty. There are agricultural programs that emphasize improving production, but these disproportionately benefit wealthier income groups. Therefore, Mexican government policy implicitly assumes that the primary path out of poverty is through improving the human capital of the children of the poor or through the indirect effects of other programs.

OPORTUNIDADES offers a clear and proven direction for poverty alleviation by providing education to the children of poor rural households, which will allow them to exit agriculture via the local/regional nonfarm economy or migration. As such, it remains a critical component of rural poverty alleviation in Mexico. To enhance the returns to OPORTUNIDADES, however, it is clearly necessary to take measures to stimulate rural nonfarm employment generation to ensure there are opportunities for the newly educated.

Agriculture still currently plays an important role for certain groups of poor rural households, however. Adults, particularly older adults, have a harder time transitioning to the nonagricultural economy since they lack education and are not receiving any additional education or training. The OPORTUNIDADES program does not address the current productive side of the rural household economy, and given the heavy demands on adult time via conditionality, potentially creates conflicts with the availability of agricultural labor on the home farm. This failure to recognize the needs of the current generation of the adult poor exposes a clear gap in Mexico's rural development policy.

We believe that a new PROCAMPO program that complements the long-term poverty-reduction strategy of OPORTUNIDADES by providing cash with productive and/or natural resource management options for smallholders can fill this gap. The program should target poor smallholders, provide alternative modalities to meet specific objectives, and include conditions that facilitate productive transformation. Although the proposed program includes a social objective, given its agricultural and natural resource management content and its focus on improving agricultural production, such a program should remain in SAGARPA and not be passed to OPORTUNIDADES, SEDESOL, or SEMARNAT.

Designing a new PROCAMPO program: Lessons from OPORTUNIDADES

1. Introduction

PROCAMPO and OPORTUNIDADES are cash transfer programs with widespread coverage in rural Mexico.[1] Each program's objectives differ and therefore so do the eligibility criteria for inclusion in the programs as well as the conditions associated with receipt of the cash transfers. Because of the focus, size, and importance of the programs, however, they have overlapping target populations and may have similar effects on the consumption and investment decisions of recipient households. This raises the issue of whether PROCAMPO and OPORTUNIDADES complement each other in achieving the broader objective of rural development or if they serve similar purposes and are thus substitutes. There is also some concern that the incentives the programs create could conflict, for example creating contradictory incentives on labor demand. As the PROCAMPO program completes the 15 years of farmer support that was originally envisioned in its creation, it is important to consider its relationship to OPORTUNIDADES and the Mexican government's the overall strategy to address rural development and poverty. Given the Mexican government's recent announcement to extend PROCAMPO and its active consideration of a redesign of the program, it is worth taking stock of the lessons learned from the OPORTUNIDADES experience.

A critical consideration in designing a new PROCAMPO is the definition of the program objectives. A new PROCAMPO could have alternative focuses such as the following: i) *PROCAMPO Social,* which could focus on improving the well-being of poorer farmers in Mexico; ii) *PROCAMPO Verde,* which could emphasize sustainable agriculture that improves natural resource management, including biodiversity; iii) *PROCAMPO Cultural,* which could focus on maintaining Mexico's cultural fabric by supporting traditional forms of agricultural production and family farming; or iv) *PROCAMPO Productiva,* which might focus on increasing agricultural output, improving efficiency and productivity, and facilitating technological adoption and alternative crop production. A PROCAMPO Social or Cultural is most likely to have significant overlap with OPORTUNIDADES in terms of target beneficiaries, and the question is whether their purposes and impacts are sufficiently distinct to justify both programs. Or alternatively, the Mexican government may consider how a new PROCAMPO might be designed to facilitate synergies between the programs.

The objective of this paper is then to examine the lessons from OPORTUNIDADES for a new PROCAMPO program while considering overall rural development policy, the potential overlap between these two programs, and the effects of interaction between the programs. Given that PROCAMPO is an agricultural program that focuses on staple producers, it is of particular interest how OPORTUNIDADES may influence agricultural production. Of course, it is also of

[1] Although originally focusing on rural households, OPORTUNIDADES has expanded coverage to poor urban households, though a majority of recipients are in rural areas. The focus of this paper is on policies focused on the rural economy and thus we focus on OPORTUNIDADES' rural beneficiaries.

interest to see if PROCAMPO influences OPORTUNIDADES' outcomes such as education, health and overall well-being of poor households.

The remaining sections of this paper are organized as follows. Section 2 provides an overview of the two programs and how they fit into Mexico's overall rural development strategy. Section 3 presents a conceptual framework for considering how cash transfer programs influence rural development outcomes. The framework focuses on why different types of cash transfer programs might have different impacts on distinct forms of productive investment. An empirical analysis of the two programs is presented in Sections 4-6. The analysis includes both a review of previous empirical studies of the programs as well as a new analysis of the data carried out specifically for this paper. The analysis focuses on the programs impacts on overall welfare (Section 4), on investment and spending in productive activities, particularly agriculture (Section 5), and on human capital investment (Section 6). This is followed in Section 7 with a discussion of the role that conditionality plays in the targeting of OPORTUNIDADES. Section 8 provides a synthesis of results of the analysis presented in this paper combined with lessons from similar programs in other countries. Based on this discussion, Section 9 provides specific policy recommendations for designing a new PROCAMPO program.

2. OPORTUNIDADES, PROCAMPO and Mexican rural development policy

In this section, the motivation for implementing PROCAMPO and OPORTUNIDADES and the objectives of the programs are briefly explained along with a comparison of the two programs. A comparison of the programs allows an evaluation of how the design may lead to different results. A discussion of the programs is followed by a discussion of how the programs fit into Mexico's overall strategy to develop the rural economy and reduce rural poverty

2.1 PROCAMPO

As a consequence of North American Free Trade Agreement (NAFTA), the prices of staple crops for producers were expected to drop sharply since US and Canadian producers can produce at lower prices and the prices for these staples had been supported by the Mexican government at levels above the border price. PROCAMPO was implemented in the winter 1994 agricultural season following the commencement of NAFTA with the promise of providing compensation for potential losses for a period of 15 years to these staple producers. A series of additional objectives were added to the primary objective of compensation for trade liberalization: improving competitiveness, supporting reconversion, technology adoption, income support for poor farmers, forest conservation and prevention of erosion and water contamination. Eligibility, and therefore the maximum level of PROCAMPO transfer payments, varies across recipient households and is dependent on the total hectares of nine key crops (maize, beans, rice, wheat, sorghum, barley, soybeans, cotton and cardamom) that were planted in the three agricultural years prior to and including August 1993. Eligibility was actually given to land parcels and those with usufruct over these land parcels, not particular farmers, and the eligibility roster was fixed prior to commencement of the program; no new properties have been added since 1994. Since the majority of land owners in Mexico are male, the eligibility roster is primarily made up of men who own land.

Because 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. Originally payments corresponded to the amount of land under production (not fallow) or in a registered environmental program[2] in a given season, which could not exceed the amount of land registered in the eligibility roster. Farmers were not required to produce a particular crop,[3] but had to use the land in some productive manner. While farmers must prove that the parcel is currently under production to receive payment, monitoring of actual planting has historically been haphazard and rarely verified in the field. However, given the program is based on past agricultural production and at least had the legal requirement that farmers continue agricultural production, the program is closely and intentionally linked to agriculture.

A few important changes have been made to the original design of PROCAMPO. First, requirements on the production of specific crops initially included in the program were relaxed making the program in fact decoupled from transfer payments. Second, in principle, payments were shifted from after the agricultural season to before the season for recipients with less than 5 hectares of land. This was done in order to facilitate the use of payments for purchasing of inputs and thus enhance the programs ability to assist farmers in overcoming liquidity constraints. At the same time, those with less than one hectare of eligible land were granted a payment equivalent to one hectare making the program more progressive. A differentiated payment was also provided for those with less than 5 hectares and electronic payment methods were implemented. Finally, in 2001 the government provided recipients with the option (PROCAMPO *Capitaliza*) of obtaining the present value of all future payments on the condition that an investment plan for using the money was provided. During 2006, approximately 20 percent of beneficiaries participated in PROCAMPO Capitaliza (GEA, 2006). Overall, these changes sought to make the program more progressive and to facilitate the use of transfers to overcome credit constraints.

PROCAMPO covers 13-14 million hectares of land each year, reaching almost three million producers and providing payments in 2006 of over US$1 billion, which constitutes around 40 percent of the budget of the Mexican Secretary of Agriculture, Livestock and Fishing (SAGARPA). Since PROCAMPO is distributed on a per hectare basis, larger farms have tended to get a greater percentage of total transfers; in terms of the traditional PROCAMPO support in 2006, plots greater then 5 hectares constituted 13 percent of all plots, but received 43 percent of total payments (GEA, 2006). 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).

2.2 OPORTUNIDADES

OPORTUNIDADES is a central element of the Mexican government's strategy to reduce poverty. Launched in 1997 following the Tequila Crisis under the name PROGRESA, the program provides cash to poor households provided that they meet certain conditions related to human capital development. The objectives of the program are to: (i) have a direct poverty-

[2] Participation in these environmental programs appears to have been fairly limited.
[3] During some years, however, beneficiaries were required to produce basic grains.

alleviation effect by increasing total household income and thus consumption, and (ii) elicit a behavioral change in these families in terms of increased investment in the human capital of their children. The strategy is therefore one of addressing short-term poverty by providing cash to increase consumption along with providing an escape from poverty for the children of the poor by improving human capital. The primary mechanism through which poverty would be reduced is through avoiding the intergenerational transmission of poverty. While adults within recipient household receive cash and health services to alleviate the impact of poverty, there is limited emphasis on providing an exit out of poverty for the adult poor.

In targeting beneficiaries in rural areas, OPORTUNIDADES employed a carefully constructed system to determine eligibility. This system used community-level geographic targeting to minimize the errors of omission (excluding the poor who should be eligible for the program) as well as household-level proxy mean tests to limit errors of inclusion (including the nonpoor in the program). The targeting procedure was as follows. First, potential recipient communities were ranked based on an index of marginality developed from the national population census. The second step was to select households for participation in the program based on data collected from a household census within the community. A proxy means test was calculated for each household using discriminant analysis, and households above the cut-off point were deemed eligible as beneficiaries. The key factors used to discriminate between the poor and nonpoor are observable household demographic characteristics and assets that indicate relative wealth. Originally, the score (or puntaje) that determined eligibility was regionally based, but this was replaced with a national puntaje that is now used. Once families are incorporated into the program, they remain in the program and receive benefits, if they adhere to the conditions placed on the receipt of the subsidies.

For eligible households, the bimonthly transfer payment is in most cases provided directly to mothers under the assumption they are more likely to use the resources to benefit their family and children. Males are only declared as recipients in the event a primary female is not available in the household which is less than 10 percent of cases. The amount of the transfer is dependent on the composition of the household and in particular on the number and age of children. OPORTUNIDADES has two different forms of cash transfers: a basic transfer composed of a food grant, to which school scholarships grants are added if children in the family are of school age. Each type of transfer is linked to separate and independent conditionality requirements. The total amount a household can receive from OPORTUNIDADES, however, is capped to limit incentives to expand the number of children in a household. At the beginning of the program (1998), the cap was just under 600 pesos, representing about 20 percent of average total household expenditures (Skoufias, 2005).

The food grant, which is the same amount for each beneficiary household, is conditional on health check-ups for all family members and on attendance at public health lectures. At registration, households set up a schedule of health appointments for all relevant household members for the year, and health providers maintain attendance records. Along with these check-ups, transfer recipients are also asked to attend health and nutrition talks at the health clinic. The health provider is required to fill in a form every two months certifying beneficiary attendance at these talks. This results in a report to the OPORTUNIDADES administrators indicating whether the beneficiary family is in compliance with the conditions of the basic food transfer. Failure to

be compliant for four consecutive months (two bimonthly periods) or for six non-consecutive months out of any twelve months (three bimonthly periods out of six) results in the family being dropped from the program.

School scholarships are linked to specific children and thus differ by household. The amounts depend on the year in school with increasing amounts for secondary school and, in particular, for female secondary school students. The grants are awarded to beneficiaries during the school calendar year and all children over seven and under 18 are eligible. Children must register and ensure a monthly attendance rate of 85 percent to receive the award. School officials verify registration by signing a form for each family and certify attendance through submitting attendance forms to the proper authorities. If attendance requirements are not met, the amount linked to that particular child is deducted from the bimonthly total payment to the family. Failure to meet the conditions associated with children's schooling, therefore, does not result in expulsion from the program but rather in loss of payment of the school scholarship.

Originally, the health and education conditions of the program were not as carefully monitored as they were later in the program. Two important changes happened that influenced the monitoring system. First was the introduction of operational guidelines (*'Reglas de Operacion'*) in mid-1999 that formalized the regulations for the program. The second change was the introduction of a *just-in-time* monitoring system[4] in mid-2000 which introduced algorithms to allow for better monitoring of conditionality. Both of these changes potentially increased enforcement of program conditions and thus increased the possibility that recipients would be declared ineligible if they did not meet program conditions.

At present, OPORTUNIDADES reaches over 5 million beneficiary households (25 million individuals) including over 3 million in rural areas. With a current annual budget of over US$3 billion per year, it constitutes Mexico's largest safety net. About eighty percent of the budget goes to transfers (approximately 45 percent to education and 35 percent to food transfers) with the remaining divided between in nutritional supplements, medical consultations and operations, the latter constituting about 6 percent of the budget (Rodriguez, 2007).

2.3 Differences between PROCAMPO and OPORTUNIDADES

PROCAMPO and OPORTUNIDADES differ in terms of targeting, eligibility requirements, conditionality, size and timing of payments and administration. PROCAMPO targets landowners, who are usually male, and requires agricultural lands to be maintained under production. Since all staple producers were eligible for the program, PROCAMPO beneficiaries represent a broader range of socioeconomic classes, ranging from subsistence users of small landholdings to large scale modernized producers. OPORTUNIDADES targets the primary female in poor rural households and requires specific behavior regarding school and health on the part of beneficiaries. OPORTUNIDADES is targeted to poor rural households, whether engaged in agricultural production or not. Payments, as measured in terms of share of total expenditures, are lower for PROCAMPO than for OPORTUNIDADES and are provided only once or twice a year.

[4] This system is known as the *Sistema Integral de Información de OPORTUNIDADES (SIIOP).*

Both programs, however, provide cash to beneficiaries and there is some question of whether cash will be used in the same way regardless of the eligibility and conditionality requirements. Note that while households receiving OPORTUNIDADES are not permitted to receive other forms of anti-poverty or education subsidies, this does not apply to PROCAMPO benefits. Thus OPORTUNIDADES and PROCAMPO transfers are provided to eligible poor rural households at the same time; OPORTUNIDADES administrative data indicate that just over 20 percent of rural recipients that entered the program during the 1996-2000 period also received PROCAMPO.

2.4 The programs and Mexican rural development policy

In the last two decades the Mexican government has undergone a significant change in its approach to rural development and poverty alleviation. These changes include a movement away from market distorting producer and consumer price subsidies towards more directly targeted programs. There has also generally been a shift from centralized programs to more decentralized programs that put more decision-making power and resources at the state and local level. These shifts are apparent in the approach to both agricultural and social policy and, as noted below, this shift has led to greater resources being put towards rural and poorer areas and away from urban and relatively wealthier areas.

In terms of agricultural policy, prior to this period of liberalization and deregulation, output and consumer prices were managed largely through CONASUPO (National Company of Popular Subsistence). With market liberalization, CONASUPO was slowly dismantled with much of the income saved from this and similar programs going to PROCAMPO as well as OPORTUNIDADES. Although the universal price supports administered through CONASUPO were phased out, targeted price supports resurfaced in the ASERCA (Agricultural Marketing Support and Services) program via a "marketing payment" to wheat, sorghum, rice, soybean and other oilseeds producers in states with historic surpluses that covered the difference between an announced policy price and a price equivalent to the import price of the commodity. In 2003, this policy was replaced by the Target Income scheme which provides a deficiency payment for all grains and oilseeds if the price drops below an agreed target level. In 2005 the marketing schemes represented 14 percent of SAGARPA's budget (OECD, 2006). Some general price subsidies remain, particularly in energy.

PROCAMPO is then a key component of this overall change in agricultural policy. Although an income support program, there has been a view that the liquidity provided by PROCAMPO might help facilitate expenditures in inputs and investment in new activities thereby improving productivity. The expectation at the initiation of NAFTA and PROCAMPO was that a range of complementary programs would be put in place to help this transition. This did not happen to the extent that was anticipated and in fact ASERCA payments have served as an incentive to stay in grains. Yet, one key program was put into place that has operated in parallel with PROCAMPO and has focused specifically on improving productivity; namely, *Alianza para el Campo*, which was initiated in 1996 and modified and renamed *Alianza Contigo* in 2003. Alianza included a number of sub-programs that ultimately sought to i) induce investments in human capital, technology infrastructure and equipment, ii) support the productive transformation of agriculture towards activities in which Mexico had a comparative advantage, and iii) facilitate the insertion of Mexican agricultural producers in the global marketing chains (Cord and Wodon, 2001).

Since its inception Alianza has been fairly decentralized, with local consultative bodies helping to identify projects for support and requiring cofinancing by beneficiaries and state governments.

Given its emphasis on inducing changes in agriculture, Alianza should have been an important complement to PROCAMPO. Yet an early evaluation of Alianza by Cord and Wodon (2001) suggests that participation, at least in the ejido sector, was low at around 10 percent, particularly compared with the 84 percent participation rate in PROCAMPO among ejiditarios. They cite a lack of knowledge of the program, a lack of resources for counterpart funding and structural aspects of the program that undermined its effectiveness. In response to problems with the program, a series of changes to Alianza were introduced beginning in 2000 and continuing in subsequent years. The changes in 2003 (that created the *Alianza Contigo* program) had the objective of fostering agribusiness development and strengthening agricultural competitiveness and grouped interventions into three areas i) capitalization, ii) product chain enhancement, and iii) technology generation (OECD, 2006).

Most of the agricultural programs supported by the Mexican government, including Alianza, are regressive in that they disproportionately benefit wealthier farmers, although they may have an indirect effect on rural poverty through job creation and other linkages (OECD, 2006). PROCAMPO, for reasons noted above, is more progressive by its design although still not nearly as progressive as targeted social programs, such as OPORTUNIDADES. Based on OPORTUNIDADES-based estimates of poverty, about 3.4 million rural Mexicans are poor. Of those, 2.1 million (62 percent) do not own land and 1.3 million (38 percent) have land but often only limited land areas (Rodriguez, 2006). By definition, PROCAMPO only provides direct support to those with access to land leaving the remaining population to be covered by other programs.[5]

In terms of social policy, to address chronic poverty in general and rural poverty in particular, the Mexican government has developed an overall strategy for poverty reduction referred to as *Contigo*. Contigo is not a specific program, but "a vision of social development with clear objectives and concrete lines of action." Government programs included under the Contigo umbrella are grouped into four areas i) improvements in human development, ii) opportunities for income generation, iii) asset accumulation, and iv) provision of social protection (Contigo, 2006). As a framework for addressing poverty, Contigo tries to integrate programs into a coherent poverty-reduction strategy. However, operationalization has proved difficult given that over 200 programs have been incorporated as part of the strategy. An assessment of the strategy notes that while social policies for the poor are well developed, policies for their income growth are not (World Bank, 2004).

OPORTUNIDADES is a central element of the Contigo strategy representing 44 percent of social investment (See Table 1). A second important component of Mexico's anti-poverty program is the Social Investment Fund (*Fondo de Aportaciones para Infraestructura Social*—FAIS) which replaced the previous rural development program PRONASOL (*Programa Nacional de Solidaridad*). FAIS provides funds for social investment through state and local

[5] Although technically the beneficiary is the person with usufruct over a given piece of land, whether renter or not, in practice, as with similar programs in other countries, the value of PROCAMPO payments are captured by the land owner.

governments prioritizing investment where there are shortfalls in social spending. It differs from PRONASOL in its focus on local governments rather directly on communities that bypassed these organizations (OECD, 2006). Funding per state is based on state-level poverty indicators although the majority of funds (88 percent) are passed on to municipalities. The funding is then used to invest in infrastructure including water and sanitation, electricity, roads, municipal urbanization, education, health and housing (World Bank, 2006). If used wisely, the program could form a supply-side complement to the OPORTUNIDADES' emphasis on increasing demand for education and health.

Another important social program related to OPORTUNIDADES is the Seguro Popular which has the objective of improving public health spending across state and ensuring that health care coverage reaches all Mexican households. The mechanism for identifying households eligible for Seguro is similar to that of OPORTUNIDADES in that it uses a questionnaire and discriminant analysis to determine eligibility. The states, however, are given leeway to adjust eligibility criteria as well as include participants of other programs such as OPORTUNIDADES. In 2005, about 2 million beneficiaries were part of the Seguro program and of those 93 percent were in the bottom expenditure quintile and 40 percent were also OPORTUNIDADES beneficiaries (Scott, 2006).

Table 1: Mexican Rural Development Programs 2005

Productive programs	Amount (pesos)	Percent productive	Percent social	Percent total
PROCAMPO	14,168	17.4%		10.2%
Alianza Contigo	7,243	8.9%		5.2%
Commercialization support	6,436	7.9%		4.6%
Productive infrastructure (FAIS)	4,378	5.4%		3.1%
Infrastructure, irrigation etc	4,285	5.3%		3.1%
Other	44,975	55.2%		32.3%
Total	*81,485*	*100.0%*		*58.5%*
Social programs				
OPORTUNIDADES	25,469		44.0%	18.3%
Seguro Popular (Health insurance)	5,999		10.4%	4.3%
Social Infrastructure (FAIS)	8,095		14.0%	5.8%
Other	18,351		31.7%	13.2%
Total	*57,914*		*100.0%*	*41.5%*
Total Rural Development	***139,399***			***100.0%***

Source: Rodriguez (2006) Cuadro IV.2
Notes: FAIS refers to the Social Infrastructure Fund

In summary, as a general overview of the current key programs for rural development, Table 1 presents the 2005 budget divided by whether a particular program focuses on productive activities or social programs. Overall, the table indicates that nearly 60 percent of public funding allocated for rural development is directed at productive programs while around 40 percent is allocated for social programs. PROCAMPO and OPORTUNIDADES are the most important programs in terms of budget allocation in each of these areas and make up nearly 30 percent of all funding for rural development (Rodriguez, 2006).

From the overview of the agricultural and social programs dedicated to supporting rural development a clear picture emerges. Over time, the Mexican government has shift away from price supports and subsidies and towards targeted interventions that have led to a substantially different approach to addressing rural development and rural poverty. PROCAMPO and OPORTUNIDADES provide direct income support to farmers and the rural poor while Alianza Contigo and FAIS provide a decentralized mechanism for putting resources into regions where they are required for investment. This has meant more resources directed to rural areas and to the poorest regions. The OECD (2006) reports that the government saw a profound shift in public funding to rural areas in terms of food subsidies (went from 40 to 55 percent of resources from 1994-2000), public health expenditures (from 20 to 28 percent from 1996-2002) and lower secondary education (from 16 to 26 percent between 1992-2002). The budget share of FAIS/PRONOSAL for the six poorest states (Veracruz, Chiapas, Mexico, Puebla, Oaxaca and Guerrero) went from 29 percent in 1988 to 54 percent in 2000.

Yet, the success of this shift in emphasis in fostering poverty reduction and rural development depends much on the success of the individual programs as well as how they work together. In general, the policy emphasis for poverty reduction is on providing the poor with services, such as health and education, which improve well being and in the long-run avoid the intergenerational transmission of poverty. In anti-poverty programs, little emphasis, however, is placed on directly improving the capacity of poor households to generate their own income. Agricultural programs, on the other hand, while emphasizing production disproportionately benefit wealthier income groups. While the shifts in agricultural and anti-poverty policy have clearly improved targeting and reduced market distortions, Mexican government policy implicitly assumes that the primary path out of poverty is through improving the human capital of the children of the poor or through the indirect effects of other programs. There appears to be little emphasis on providing productive opportunities so that the current rural poor can achieve their own way out of poverty.

3. Cash transfers and productive investment: Some conceptual issues

Predicting the impact of transferring cash to households requires carefully considering how households might respond to this income flow. The response is likely to depend on two critical factors: i) the type of household and individual receiving the transfer (eligibility), and ii) the manner in which the transfer alters incentives by putting conditions on receipt of the transfer (conditionality). The type of household that will receive the transfer depends on the targeting mechanism used by the program and the eligibility criteria placed on receipt. Households and individuals will vary in their response to income received based on differences in preferences, but also on differences in assets owned and constraints that they face in their consumption and investment decisions. The response will also depend on if conditions placed on transfer receipt in effect alter relative prices thereby changing incentives. In this section, we consider these conceptual issues.

3.1 Unconditional versus conditional transfers

Transfers, whether conditioned or unconditioned, will potentially have an income effect—that is, by providing income, even without conditions, recipients may respond by demanding more goods and services. Program objectives may then be met even without imposing conditions on

the receipt of transfers if the income effect is sufficiently strong to induce the desired outcome. For example, if child education and health are normal goods—that is, goods for which demand increases with income—an increase in income alone may increase the spending on these goods. The evidence does suggest that changes in wealth are positively and significantly associated with changes in demand for education (Glewwe and Jacoby, 2004). A program like OPORTUNIDADES could then conceivably achieve its objectives of increased child education and health outcomes without imposing any conditions on receipt or needing to fund the monitoring of conditions.

Along with increasing demand for goods and services, unconditional transfers may induce investment in productive activities, particularly if households are credit constrained and investment is limited due to these constraints. Evidence from South Africa's pension program suggests that households tend to use the additional income from transfer payments in a manner similar to other income (Case and Deaton, 1996). This suggests the distinction between transfer and nontransfer income is not important and that if households tend to save or invest a certain share of income they are likely to use new income such as transfers in a similar manner. The extent of this investment, however, is likely to depend on how cash constrained a household is. If a household is limited in its ability to invest in productive activities such as agriculture, cash may allow it to overcome such constraints. To consider this possibility, we briefly discuss the decision-making of agricultural households.

For agricultural households, production and consumption decisions can be separated into two distinct problems if markets function perfectly (the separability condition). Under such conditions, the household can first make all production decisions which lead to an implied level of profit. This profit, plus any unearned or transfer income, can be taken as the budget constraint for the household in the consumption decision.[6] The link between production and consumption is through the output price of own farm production, which effects both profits and the consumption budget constraint, and the wage rate, which enters both the production side and the consumption side (as the price of leisure).

The separability result breaks down when some markets are not perfect, as is very likely the case among poor agricultural households in rural Mexico. In such a situation, production decisions will depend on "shadow prices" for nontraded items, and these shadow prices will depend on household preferences. Two key market failures are very likely to be present in rural Mexico; first, cash or liquidity constraints because of imperfect credit markets, and second, labor market constraints due to friction in the labor market that limits the ability to buy or to sell labor.

The cash constraint will be more binding for poorer agricultural households and those with larger on-farm activity (everything else equal). For cash constrained household, the price of an activity that enters into the constraint will be marked up by the shadow price of credit; the more binding the credit constraint the higher the shadow price and the greater the mark-up. Activities that relax the constraint (that generate cash) such as off-farm labor supply or cash crop production will be preferred, while activities that make the constraint more severe such as purchased intermediate

[6] For a detailed discussion of how agricultural and nonagricultural households differ see Handa et al (2006).

inputs like fertilizer or farm equipment will be reduced since the shadow price of these activities to the household is higher than the market price.

Now consider a binding labor market constraint such as a fixed availability of off-farm labor opportunities. Agricultural households have on-farm labor requirements and off-farm labor demand. In the face of limited off-farm labor opportunities, the shadow value of time within the household changes to bring supply and demand into balance; this entails a reduction in the household's shadow wage which dampens labor supply and increases leisure time. The impact of the constraint on the household depends on the ability of the agricultural activity to absorb the excess labor. Those with less land may face a greater constraint.

For a cash transfer program that focuses on the rural economy, it is critical for predicting impact to recognize that households are making decision in this context where markets are often nonexistent or imperfect. Incentives are altered, but households are also constrained in their ability to make decisions. Cash transfers can help overcome certain constraints, such as those on access to credit, but not other constraints, such as barriers to entry into activities that require access to a new technology or particular knowledge. Transfers may provide liquidity for households allowing them to purchase inputs or invest in production which may require the household to provide complementary labor thus boosting demand for labor on farm. These changing incentives may lead to shifts in labor demand as there is increasing competition between different activities.

If a cash transfer provides liquidity to purchase inputs thereby allowing the household to use excess labor, this investment can multiply the benefits of a transfer program by inducing additional income through this productive investment. The size of this household-level multiplier is dependent on the level of investment induced by the transfer which itself would depends on the constraints facing the households and opportunities available. This shows, however, that for beneficiaries, unconditional transfers may induce investment even for those programs in which the intent is not to promote such investment.

While an unconditional transfer induces an "income effect", conditionality alters the "price" of certain activities and can lead to a substitution effect—that is, by placing conditions on transfer receipt the program alters the relative price of a good which now may substitute for, or be substituted by, another good. Conditionality then alters incentives and can shift the basket of goods purchased by the household, the inputs used in productive activities or even the investments a household makes. How the recipients respond depends on the specific conditions that are imposed and the degree to which the conditions are enforced, or even perceived to matter. If stated conditions are not enforced and recipients do not perceive that they will ever be enforced, a conditional cash transfer (CCT) program is no different than an unconditional one. If conditions are fully or partially enforced or perceived to matter by recipients, they may alter incentives and thus behavior.

To understand the impact of transfers on household behavior in general, and on productive investment in particular, requires considering both the income effect and substitution effect. How a specific household or individual responds in relation to its productive activities depends on

their asset portfolio and the context in which they manage those assets. This is discussed in more detail in the next section which addresses how eligibility influences outcomes.

3.2 The role of targeting and eligibility

Programs are generally targeted at a particular segment of society to meet certain objectives. In order to target a certain population, programs define the eligibility criteria that determine who will receive the program. Programs such as OPORTUNIDADES that are designed to address poverty generally use some form of welfare measure such as an asset-based wealth index to identify eligible households. Agricultural programs, such as PROCAMPO, define eligibility based on the agricultural activities or assets of households. Within those households, the manner in which the specific recipient is defined also depends on the objectives of the program. The impact of a program is therefore closely linked to how the eligibility criteria are defined since it is these criteria that determine who will receive a program. Given the programs of interests in this study, two key eligibility criteria should be carefully considered: i) criteria related to the gender of the recipient, and ii) criteria related to the productive activities and assets of households.

CCT programs like OPORTUNIDADES generally provide cash transfers directly to women under the assumption that they are more likely than men to spend money on the education and health of their children. The basis of this argument is the evidence that women spend income from own-earnings differently from men and, in particular, tend to spend more on children's health and nutrition (Haddad, 1999). The evidence also indicates that more assets in the hands of women, and thus greater female bargaining power within the households, results in increased budget shares for education (Quisumbing and Maluccio, 2000). Taken together, the evidence suggests women spend more on food (nutrition), health and education of their children than men. CCT programs, therefore, explicitly recognize that eligibility criteria can be used to influence outcomes. By focusing on women, they are seeking to promote certain health and education outcomes. The traditional focus of many programs on directing support on men, implicitly assumes that focus is appropriate for the objectives of the particular program. That, of course, depends on if men are more likely than women to take actions that are conducive to meeting program objectives.

Gender is only one of many eligibility criteria that may influence outcomes. For PROCAMPO and similar programs, the key criteria are land access and the use of land for staple production. PROCAMPO recipients by definition produced at least one of nine staple crops during the agricultural seasons prior to the initiation of the program. As such, they tend to be households with land for agricultural production and most likely ones who have invested in other agricultural assets. The response of PROCAMPO beneficiaries to transfers may differ from OPORTUNIDADES beneficiaries since PROCAMPO households are more likely to be agricultural producers, and are thus both producers and consumers of staples, and demanders and suppliers of labor. As noted above, the response of agricultural households depends on the constraints they face particularly in the credit and labor markets.

Targeting of females versus males, agricultural households versus nonagricultural households, children versus parents or by other criteria will therefore influence the impact of the program.

Understanding and using the fact that eligibility matters is critical to both evaluating the impact of programs and in designing ones that achieve a specific objective.

3.3 Conditionality and targeting

The impact of a program depends not just on the response of those eligible, but also on who remains in the program. In an unconditional transfer program, the expectation is that most households would remain in the program since the receipt of cash has little costs. Conditionality, by imposing some requirements on recipients, may lead to a degree of self targeting by recipients so that some households may drop out of the program or may be dropped from the program for failing to meet program conditions. This can be viewed positively if it helps to reduce the errors of inclusion (including those not intended as targets), but can be viewed negatively if it increases the errors of omission (excludes those that should be targeted).

Since conditions on the receipt of transfers may encourage self selection out of the program, they can act as a screening mechanism, screening out those who the program does not wish to target (Das, Do and Özler, 2005). Such screening mechanisms have been used in workfare programs through placing work requirements on program recipients such that only the unemployed self selection into the program (Jalan & Ravallion, 2003; Galasso & Ravallion, 2003). Conditions on transfer receipt can thus be designed not just to encourage a certain type of behavior, but to improve program targeting by inducing households that are not the intended target to drop out of the program. Alternatively, conditions, if not carefully considered, can have inadvertent consequences and increase errors of omission if those who are induced to self select out of the program are the target population.

3.4 Evaluating and designing cash transfer programs

In evaluating the impact of OPORTUNIDADES and PROCAMPO in general and on productive investment, we will consider not just the impact of each program but the factors that influence that impact. Namely, we focus on how the conditions placed on receipt of the transfer and eligibility requirements influence the outcomes found in both programs. Understanding these factors is critical in designing cash transfer programs.

Before proceeding to the impact analysis, a few notes on the ability to analyze and evaluate these programs are warranted. In order to conduct an adequate evaluation of a program, it is necessary to have a proper control group to which to compare beneficiaries of a program (known as the treatment group). Ideally, this control group is identical in every way to the treatment group except in having received the program. This allows an evaluation that can adequately identify the impact of the program. At the initiation of OPORTUNIDADES in 1997 (or PROGRESA as it was then known), the program was randomly allocated to eligible localities in order to facilitate impact evaluation. While not perfect, the manner in which treatment and control localities were allocated allow for program evaluations that can identify household and individual level program impact. The evaluation period is from 1997-1999 and although later data was collected for evaluation (2003) this was not considered as valuable as the earlier data. Most of the evidence on the impact of OPORTUNIDADES thus comes from this earlier period. For PROCAMPO, by definition all households that produced staples in the period before the initiation of the program were deemed eligible. As such, evaluating PROCAMPO has been challenging because of the

difficulty in identifying a proper counterfactual; that is, household identical to recipients that did not receive the program.

In both cases, an alternative to conducting an impact evaluation has been to try to look at the behavior of recipients and how this varies by recipient characteristics. This can be done by using data only on recipients such as administrative data. It should be clear, however, that this does not allow for statements regarding program impact, but only discussions of how different households responded to the program. In the analysis below, results from the analysis of both types of data are presented. We focus first on providing a brief overview of the estimated overall welfare impacts of the programs (Section 4) and then a discussion of the impact of the programs on productive activities (Sections 5 and 6).

4. Overall welfare impacts of OPORTUNIDADES and PROCAMPO

Measuring the program impact on household welfare requires deciding on the best manner in which to measure it. One obvious choice is using consumption expenditures or income to get a sense of whether the household's economic well-being has improved. Expenditures are generally considered a better measure of welfare than income since they tend to fluctuate less over time and are often easier to measure. Of course, alternative measures of well-being such as caloric intake or measures of nutrition and health or education outcomes, particularly in the case of OPORTUNIDADES, can also be used. Indicators of education and health impact are considered below, so here we focus on expenditures/income as well as food expenditures and caloric intake as measures of food security.

Evaluations of the impact of OPORTUNIDADES use the experimental data collected at the outset of the program mentioned above. Based on these data, transfers provided by OPORTUNIDADES to recipient households are worth approximately 20 percent of household expenditures.[7] This led to an on average increase in total expenditures of approximately 15 percent with the remaining transfer income anticipated to be used for savings or other purchases such as durable goods. Eighteen months after the initiation of the program (November 1999), median value of food consumed increased relative to the control group by 11 percent and caloric intake by 7 percent. The results for the lower quartile of the distribution for food consumption are slightly higher (14 percent) suggesting that the poorest households increased consumption even more than the median (11 percent) and relatively wealthier households (5 percent). The increase in caloric intake is similar for all households and the evidence indicates that the increase is driven by improvements in dietary quality with greater consumption of fruits, vegetables, meats and animal products.

In order to assess the impact of OPORTUNIDADES on poverty, Skoufias (2005) estimates household income from before and after the program for both control and treatment households. With these data and poverty lines based on the basic food basket and the median income in 1998, he finds that OPORTUNIDADES significantly decreased the percent of households in poverty

[7] The results presented here come from Skoufias (2005), Hoddinot, Skoufias and Washburn (2000) and Hoddinot and Skoufias (2003). The results from the papers are similar but details vary and are taken as appropriate from each paper.

(head count ratio), reduced the poverty gap and led to a decline in the severity of poverty (measured as the poverty gap squared). Based on the median measure of poverty, the head count ratio reduced by 17 percent, the poverty gap by 36 percent and the severity of poverty by 46 percent. Taken together, these results show that OPORTUNIDADES had a significant impact on the welfare of recipient households and in particular on the poorest households.

We move now to considering whether PROCAMPO had similar effects to OPORTUNIDADES. Sadoulet, de Janvry and Davis (2001) conduct one of the few studies of PROCAMPO that can identify impact of the program. They use panel data collected in the Mexican ejido sector before PROCAMPO began in 1994 and after it started (1997). The ejido sector is a product of land reform that followed the Mexican revolution in the early twentieth century and, at the time of the study, represented 60 percent of the Mexico's rural population and about half of the agricultural land. The study seeks to determine the impact of PROCAMPO on creating a multiplier effect. As noted in the conceptual discussion, a multiplier effect occurs when recipients invest transfers in productive activities and this generates additional income which can thus lead to an increase in income beyond the amount directly transferred.

Table 2 presents results of Sadoulet, de Janvry and Davis' (2001) analysis of the multiplier effect on income for all households and different categories of households. The results indicate an overall multiplier of around two which suggests that on average an addition peso transferred to PROCAMPO households generates two additional pesos of income. They attribute this high increase to PROCAMPO allowing households to overcome liquidity constraints and thus invest in agriculture, possible long-run investment in productive assets such as health and livestock, and interhousehold multiplier effects which leads to greater aggregate demand in a given region. The results suggest that prior to PROCAMPO agricultural households in the ejido sector were severely cash constrained and unable to invest in activities that had a high positive return. The results are for the initial period after PROCAMPO started when NAFTA had been initiated and the Tequila crisis had occurred. The high results may be due to these significant macroeconomic changes that occurred over this period or the pent up demand for liquidity, but it is unlikely that such high multipliers would continue over the entire period since they would suggest a major increase in income over time of recipients which was not observed. While the magnitude of change may be peculiar for this period, the direction clearly shows the potential for transfers in having an effect on production and thus overall welfare.

Breaking the multiplier down by different household categories, it is clear that the biggest multiplier effects are for households with medium and larger landholdings (multipliers of 2.77 and 2.04 compared to 0.24 for smaller farms). Households with less labor also appear to have a larger multiplier effect. This may be because liquidity constraints hit them more severely since they cannot use surplus labor off-farm to obtain cash. The multiplier is slightly higher for households with more education although this turns out not to be significant. It is also higher for non-indigenous households and not significantly different than zero for indigenous households. Regionally, the multiplier is largest (and significant) for the Gulf and Center regions. The results suggest that there is variation in the shadow value of liquidity across household types and regions.

Table 2: PROCAMPO multipliers and income effects

	Coefficient (Multiplier)	T-stat	Observed change in total income (1994-1997)	Income change due to PROCAMPO (percent of 1994 income)			Income change without PROCAMPO
				Direct	Indirect	Total	
All households	2.06***	(7.1)	14.2%	8.7%	9.3%	18.0%	-3.9%
Land assets							
Small (< 3 ha)	0.24	(0.4)	20.9%	7.6%	-5.8%	1.8%	19.1%
Medium (3-7 ha)	2.77***	(3.6)	29.7%	10.7%	19.0%	29.7%	0.0%
Large (>7 ha)	2.04**	(4.3)	4.8%	8.3%	8.6%	16.9%	-12.1%
Household labor assets							
Low (<4 adults)	2.75**	(9.2)	2.2%	8.6%	15.1%	23.7%	-21.5%
High (4 or more adults)	0.93*	(2.0)	27.3%	8.9%	-0.6%	8.3%	19.0%
Adult education assets							
Low (< 4.5 years on average)	1.25**	(3.6)	9.8%	10.7%	2.7%	13.3%	-3.6%
High (4.5+ on average)	1.60**	(3.3)	16.8%	7.6%	4.6%	12.2%	4.6%
Ethnicity							
Indigenous household	0.19	(0.5)	30.4%	11.6%	-9.4%	2.2%	28.2%
Non-indigenous household	2.27**	(6.6)	12.1%	8.4%	10.7%	19.1%	-6.9%
Region							
North-Pacific	-2.1	(0.3)	42.6%	12.8%	-10.9%	1.9%	40.7%
North	0.15	(0.8)	-40.2%	3.2%	-9.9%	-6.7%	-33.5%
Gulf	2.21**	(5.5)	94.4%	18.4%	33.3%	51.6%	42.8%
Center	2.81**	(4.7)	19.7%	10.4%	12.6%	23.0%	-3.4%
South	1.09	(0.8)	15.0%	5.2%	0.5%	5.7%	9.3%

Source: Sadoulet, de Janvry and Davis (2001) Tables 4 and 6

Notes: *significant at 10%, **significant at 5% and ***significant at 1%.

To get a sense of the contribution of PROCAMPO to income maintenance, Sadoulet, de Janvry and Davis use the multipliers and actual income changes to predict what would have happened to income without PROCAMPO. They divide the total effect of PROCAMPO between direct effects (monetary value of transfers) and indirect effects (generated through multipliers). The results of this analysis are presented in Table 2 in columns 3-7. The results indicate that without PROCAMPO, households' income would have declined on average by nearly 4 percent between 1994 and 1997 for recipient households. PROCAMPO increased income by 18 percent during this period and this led to a net increase in income of 14 percent. Among the different household categories the largest benefits were for those households already found to have high multipliers; namely, those with medium and large size farms, less labor, non-indigenous and in the Gulf and Center of the country. Overall the results indicate substantial income gains due to the PROCAMPO program.

While both programs appear to have a positive impact on the welfare of recipients, it is difficult to assess whether the overall impact is similar for two reasons. First, households in the two programs differ with OPORTUNIDADES targeting the rural poor and PROCAMPO farmers that produced staples. The expectation is that impact will differ due to differences in household type. Second, the data used are not comparable making it difficult to determine whether differences in results are due to the dissimilarities between the programs, the types of households analyzed or variation in data collection. To overcome this difficulty, two options are possible. The first is to use the OPORTUNIDADES' experimental data to compare the two programs. This limits the pool of PROCAMPO recipients to only those that are defined as asset poor using OPORTUNIDADES criteria. Furthermore, although OPORTUNIDADES was randomly assigned PROCAMPO was not, making it difficult to identify the impact of the program for

reasons noted above. The key factors for determining eligibility for PROCAMPO are known—namely, the use of land for staple production—and can be controlled for in any regression analysis but concerns remain over whether estimates would be unbiased.

Following this first option, Ruiz-Arranz et al (2005) use the OPORTUNIDADES experimental data to examine whether the two programs had a differential impact on household food security and nutrition. Rather than using average effects through the inclusion of a dummy variable in the regression analysis, they use monthly per capita payments from each program to determine whether cash is cash regardless of which program it comes from. With this approach, they find no systematic difference in the impact on food security as measured by food consumption and caloric intake—a peso from either program has a significant positive effect on food security and there is no significant difference between the coefficients associated with each program thereby suggesting a similar impact. The results also indicate that both programs increase food diversity leading to greater consumption of meats and vegetables. The mechanism by which this occurs varies though with OPORTUNIDADES households tending to use additional cash to purchase more foods while PROCAMPO recipients tending to produce more from home consumption reflecting the fact that PROCAMPO recipients tend to be agricultural households. The results thus indicate a similar ultimate affect on household welfare of the two programs.

A second option to comparing the impact of the programs is to use the ENRHUM data which is a survey of rural Mexican households that was collected in 2002.[8] This has the advantage of being national in scope and more recent than other available data (seven years after PROCAMPO was started and four after OPORTUNIDADES was initiated). The disadvantage is again concern over bias generated by the fact program recipients differ from the rest of the rural population. The main source of bias, however, is due to the program criteria, which is observable and known in the case of both programs. When program placement bias is the primary concern, it is possible to use propensity score matching to try to identify impact. This process assumes that there are households in the data that were are not program participants, but that have similar characteristics to participant households. The matching procedure finds these households. Given the national and near universal coverage of both OPORTUNIDADES and PROCAMPO, finding such households is not easy so results should be viewed with some caution.

Using the 2002 ENRHUM data and propensity score matching, Table 3 provides an estimate of the impact of the two programs on income per capita. The direction of impact is in the expected direction in both cases—each program appears to positively influence income per capita. The estimates are larger for PROCAMPO than OPORTUNIDADES although this cannot be formally tested and it should be noted again that these are different populations. OPORTUNIDADES is matched with similar, namely poor, households that do not receive the program and PROCAMPO with agriculture households that do not receive the program. In none of the cases, however, is the result significant. This may reflect that the programs do not have a significant effect. However, given the small sample size and the difficulty in finding adequate matches in these nearly universal programs, it is better to error on the side of caution and draw no strong conclusions. Overall, the evidence from other sources noted above, clearly point to positive impacts on welfare of the programs.

[8] The authors are grateful to Ed Taylor and Antonio Yunez-Naude for providing access to the data and Lisa Pfeifer for providing research assistance in the analysis of the data.

Table 3: Program impact on income per capita, 2002

Matching method	OPORTUNIDADES	PROCAMPO
Stratification	1867	3568
	(0.918)	(0.898)
Radius matching	995	4400
	(0.470)	(1.116)

Source: Calculated with the research assistance of Lisa Pfeifer using the ENRHUM data

Notes: t-stats in parentheses.

5. Impacts of OPORTUNIDADES and PROCAMPO on productive investment and spending

If poor households are liquidity constrained, transfers may allow them to invest in income-generating activities that they would have been unable to invest in if they did not have the transfer. The principal areas where rural households invest are in crop and livestock production although they could also invest in nonagricultural microenterprises. Along with investing in productive capacity, recipients could increase spending on inputs in activities improving the efficiency of production. In this section, we consider whether OPORTUNIDADES and PROCAMPO induced such investment and spending in income-generating activities. As part of the discussion, differences in the conditions and eligibility of the two programs are kept in mind.

First, we consider the impact of OPORTUNIDADES on productive investment. In assessing the impact of OPORTUNIDADES on productive investment Gertler, Martinez and Rubio-Codina (2006) report that recipients consume approximately 88 percent of the transfer they receive but invest the remaining 0.12 pesos, obtaining on average returns of 17.6 percent of each peso invested. This implies that households are liquidity constrained since this is substantially higher than the average interest rate of 6.1 percent during the period in question. The results suggest that this investment leads to an increase in consumption of beneficiary households of over 30 percent over the five and a half period year from the beginning of the program to when the data were analyzed (which would imply a multiplier of 1.3). To get a sense of where the investment is occurring, Table 4 summarizes key results of their analysis.

The top panel in Table 4 shows the impact of OPORTUNIDADES on participation in a range of productive activities while the lower panel looks at the depth of involvement. For agricultural outcomes, the results are shown for households as a whole as well as for those who had none of the productive asset of interest at the 1997 baseline. This allows an assessment of whether the program has increased entry into ownership of key productive assets. Looking at the top panel the results clearly show that the program increased entry into a number of productive activities. As a result of the program, ownership of draft animals, production animals, and land use was significantly higher. Draft animal ownership increased by over 4 percent from a base of 25 percent ownership, productive animal ownership increased by a similar amount from a base of 71 percent ownership and land use increased by 3 percent from a base of 59 percent use. For production animals and land use the results were greater for those with no access, respectively, to production animals and land. The results also indicate that participants were more likely to

initiate microenterprises as the probability of ownership is increased by the program by nearly 3 percent from a base of only 6 percent.

Table 4: OPORTUNIDADES and investment in productive activities

DISCRETE OUTCOMES	Draft animal ownership	Draft animal ownership given no ownership 97	Production animal ownership	Production animal ownership given no ownership 97	Land use	Land use given no use 97	Micro-enterprise
Treatment status	0.044**	0.022**	0.037**	0.062**	0.028	0.052**	0.028**
	(0.017)	(0.011)	(0.017)	(0.028)	(0.025)	(0.025)	(0.012)
Treatment status times							
No agricultural assets	-0.009	-0.008	0.075**	0.094***	0.063*	0.065*	
	(0.034)	(0.019)	(0.022)	(0.033)	(0.038)	(0.039)	
Landless	0.065**	0.035**	0.029*	0.096	0.045*	0.049*	
	(0.026)	(0.017)	(0.018)	(0.075)	(0.025)	(0.025)	
Smaller farm (≤3 ha)	0.038*	0.029*	0.028	-0.003	-0.002		
	(0.022)	(0.016)	(0.020)	(0.041)	(0.025)		
Larger farm (>3 ha)	0.046	0.000	0.035	0.007	0.026		
	(0.028)	(0.022)	(0.023)	(0.083)	(0.032)		
Mean value (control)	0.248	0.108	0.708	0.453	0.588	0.329	0.058

CONTINUOUS OUTCOMES	Number of equivalent draft animals	Number of equivalent draft animals given no ownership 97	Number of equivalent production animals	Number of equivalent production animals given no ownership 97	Number of hectares used	Number of hectares used given no use 97
Treatment status	0.031	0.062*	0.092	0.100	0.038	0.031
	(0.023)	(0.034)	(0.065)	(0.068)	(0.086)	(0.113)
Treatment status times						
No agricultural assets	0.005		0.022		0.047	
	(0.030)		(0.082)		(0.090)	
Landless	0.019	0.017	0.012	0.007	0.06	
	(0.024)	(0.047)	(0.066)	(0.070)	(0.070)	
Smaller farm (<3 ha)	0.071***	0.078***	0.119*	0.125*	0.036	0.055
	(0.023)	(0.038)	(0.064)	(0.069)	(0.068)	(0.097)
Larger farm (>3 ha)	0.088***	0.112**	0.234***	0.291***	0.0162**	0.182
	(0.028)	(0.046)	(0.076)	(0.083)	(0.082)	(0.111)
Mean value (control)	0.152	0.367	0.651	0.741	1.239	1.790

Source: Gertler, Martinez and Rubio-Codina (2006) Tables 5 and 6, Treatment on the treated with controls.

Notes: *significant at 10%, **significant at 5% and ***significant at 1%. Standard errors in parentheses.

To identify the types of households investing in agricultural activities results are disaggregated by the status of the household in terms of its agricultural assets with the categories being i) no agricultural assets, ii) landless but owning animals, iii) smaller farms (using up to 3 hectares of land) and iv) larger farms (using over 3 hectares of land). The results show that participation in OPORTUNIDADES is leading those with no assets to enter into ownership of production animals and to use land. Landless are similarly affected by the program but also appear to be obtaining draft animals. Small farms are only affected by an increase in draft animal ownership while large farms are, not surprisingly, unaffected since they are likely to own these assets already.

The second panel in Table 4 presents the results for the impact of OPORTUNIDADES on the overall amounts of animals owned and land used. The overall impacts are limited with only general effects on the number of draft animals owned given a previous lack of ownership (which may simply be because of entry into ownership). The results broken down by land holding category do indicate that smaller farms and larger farms significantly increased the number of draft and production animals and larger farms increased the number of hectares used. Taken together the results point to an increase in entry into ownership of animals and land use by asset poor beneficiaries and an increase in number of animals owned and land used by more asset rich households. Thus, OPORTUNIDADES by providing cash to poor households does seem to induce a degree of asset investment.

The data presented in Table 4 present broadly whether OPORTUNIDADES led to investment in agriculture and nonagricultural self-employment and indicates some increase in land use by recipients. Ideally, we would also get some sense of whether OPORTUNIDADES led to shifts into new crops and intensification of production through greater input use (another sign that transfers helped overcome liquidity constraints). Unfortunately, it is not possible to measure the impact of OPORTUNIDADES on agricultural production directly as the evaluation surveys did not include agricultural production modules. However, in the consumption module, household consumption of food from own production is reported for crop foods as well as for meat and dairy products, increasing the variety of foods for which a program impact can be measured. Furthermore, overall agricultural spending is reported and can be used as a measure of intensification. These are reported in surveys conducted in October 1998 and May 1999 and can therefore be used to look at seasonal differences in impact. The results of this analysis are reported in Table 5.[9]

The results indicate that OPORTUNIDADES increases the probability of consuming from home consumption, confirming the results above that the program had an impact on entry into land use and animal production. The data also show that the value of per capita home production is significantly higher for recipients than non-recipients in October 1998 although not significant for May of 1999 suggesting seasonal differences. The number of foods and food groups produced by the household increased significantly in both periods, however, suggesting that the program led to an expansion in the number of crops produced. The analysis shown in the second panel indicates in more detail how this occurred. In the fall of 1998, there is a significant increase in consumption of fruits (by 4.5 percent from a base of 24.2 percent) and consumption of meat (by 2.1 percent from a base of 6.9 percent) for beneficiaries while in the Spring of 1999 there is an increase in consumption of meat from home consumption (by 1.4 percent from a base of 5.4 percent) and an increase in consumption in vegetables (by 3.9 percent from a base of 22.4 percent). The results imply significant entry into new agricultural activities in both seasons.

[9] This analysis is part of on-going research being conducted by Todd, Winters and Hertz (2007).

Table 5: OPORTUNIDADES and agricultural production

	All households		Landless (1997)		≤3 hectares (1997)		>3 hectares (1997)	
Own consumption	Oct-98	May-99	Oct-98	May-99	Oct-98	May-99	Oct-98	May-99
Consumes from own production	0.0393**	0.0433**	0.0424*	0.0520**	0.0458**	0.0448*	0.0295	0.0047
p-value	(0.036)	(0.022)	(0.082)	(0.020)	(0.048)	(0.063)	(0.282)	(0.864)
mean value (control)	70.3%	67.6%	64.3%	62.9%	74.0%	69.5%	76.9%	75.8%
Per capita value home production	3.0009***	1.7624	2.7299**	1.3489	3.2882**	3.0488*	2.8596	-0.3139
p-value	(0.008)	(0.204)	(0.031)	(0.373)	(0.033)	(0.083)	(0.130)	(0.880)
mean value (control)	25.24	23.64	21.38	21.71	27.34	23.80	30.29	28.63
Number of food groups	0.0952***	0.1103***	0.0921**	0.1200**	0.1093***	0.1245***	0.0800	0.0592
p-value	(0.006)	(0.005)	(0.040)	(0.015)	(0.007)	(0.010)	(0.155)	(0.266)
mean value (control)	1.17	1.14	1.02	1.03	1.25	1.17	1.38	1.33
Number of foods	0.1041***	0.1236***	0.1074**	0.1279**	0.1095**	0.1435***	0.0983*	0.0708
p-value	(0.005)	(0.004)	(0.025)	(0.020)	(0.014)	(0.004)	(0.087)	(0.201)
mean value (control)	1.27	1.18	1.10	1.08	1.35	1.22	1.49	1.38
Own consumption by food group								
Cereals from own production	0.0232	0.0381	0.0107	0.0171	0.0424	0.0649**	0.0131	0.0262
p-value	(0.312)	(0.123)	(0.683)	(0.558)	(0.144)	(0.038)	(0.733)	(0.496)
mean value (control)	53.3%	50.2%	46.6%	45.7%	58.5%	53.1%	57.9%	54.8%
Beans from own production	0.0119	-0.0026	0.0108*	0.0045	0.0209**	-0.0040	-0.0054	-0.0191
p-value	(0.146)	(0.700)	(0.074)	(0.239)	(0.050)	(0.631)	(0.778)	(0.346)
mean value (control)	5.8%	5.5%	2.8%	2.5%	6.3%	6.3%	12.9%	11.9%
Fruits from own production	0.0450**	0.0261	0.0301	0.0303	0.0507**	0.0204	0.0675**	0.0329
p-value	(0.041)	(0.161)	(0.226)	(0.137)	(0.045)	(0.367)	(0.038)	(0.229)
mean value (control)	24.2%	16.1%	24.0%	14.9%	24.1%	16.9%	25.2%	17.5%
Vegetables from own production	0.0012	0.0386**	0.0056	0.0352*	0.0003	0.0441*	0.0039	0.0289
p-value	(0.926)	(0.032)	(0.672)	(0.088)	(0.987)	(0.055)	(0.841)	(0.329)
mean value (control)	11.6%	22.4%	11.3%	22.8%	11.9%	21.5%	11.7%	23.7%
Meat from own production	0.0209***	0.0142**	0.0190**	0.0108	0.0196**	0.0187**	0.0273*	0.0134
p-value	(0.008)	(0.027)	(0.024)	(0.113)	(0.047)	(0.029)	(0.083)	(0.362)
mean value (control)	6.9%	5.4%	5.6%	4.5%	7.6%	5.8%	8.3%	6.9%
Agricultural spending								
Reports agricultural spending	0.0561**	0.0232	0.0331	0.0150	0.0536**	0.0295	0.0518	0.0194
p-value	(0.010)	(0.264)	(0.126)	(0.441)	(0.045)	(0.293)	(0.149)	(0.597)
mean value (control)	44.2%	34.4%	24.9%	21.0%	56.6%	42.7%	64.4%	49.0%
Amount spent per hectare	63.3331*	45.2621	13.9241	37.0718	87.6359	38.1638	30.0766	40.3828
p-value	(0.060)	(0.209)	(0.462)	(0.292)	(0.108)	(0.477)	(0.409)	(0.584)
mean value (control)	215.68	185.09	159.21	118.68	269.62	251.07	225.57	189.70
Amount spent per capita	0.0114**	0.0058	0.0072	0.0032	0.0010	0.0080	0.0151*	0.0047
p-value	(0.011)	(0.150)	(0.101)	(0.407)	(0.123)	(0.162)	(0.067)	(0.551)
mean value (control)	0.08	0.06	0.05	0.04	0.10	0.08	0.11	0.09
No. of observations	9178	9178	3733	3733	4161	4161	1284	1284

Source: Authors' estimation

Notes: *significant at 10%, **significant at 5% and ***significant at 1%. P-values in parentheses.

The final panel in Table 5 examines agricultural spending to get a sense of whether there was an intensification of production. In October 1998, an increase in the probability in spending by 5.6 percent from a base of 44 percent is noted which corresponds to an increase in the use of land noted earlier. There is also a significant increase in the amount spent per hectare and per household capita indicating that the amounts spent by recipient households was much higher than nonrecipients. However, there is no increase the probability of spending in May 1999 and no increase in the amount of spending either in a per hectare basis or a per capita basis. Taken together the analysis shows that OPORTUNIDADES appears to have had a substantial influence on investment in the productive activities of beneficiaries. They entered in animal production, invested in draft animals, initiated land use, and expanded the number of agricultural products produced and consumed, but only moderately appear to intensify production.

The columns on the right hand side of Table 6 explore the heterogeneity of impact of OPORTUNIDADES on different land ownership categories; namely, those reporting no land in the baseline 1997 survey, those reporting using some land but less than 3 hectares and those reporting more than three hectares. The results on own consumption are similar for the landless and smallholders (3 hectares or less) but not for the larger land category. The landless and smallholders have an increased probability of producing food for home consumption, have a higher value of per capita food produced (except for May 1999 for the landless) and consume more food groups. With the exception of October 1998 for number of foods, none of the results are significant for the largest land category. This indicates that it is the landless and smallholders that are most constrained in production and thus most assisted by OPORTUNIDADES.

In terms of the results for the different food groups presented in the second panel, the results suggest a mixed picture. All groups have a high probability of consuming meat from home production in October 1998 and the smallholders for May 1999 as well. Thos not cultivating land in 1997, also see moderate increases in bean production in October 1998 and vegetable production in May of 1999. The larger expansion in adoption of new foods for home consumption appears with the smallholders who increase bean and fruit production in October 1998 and vegetable production in May 1999. Those with initially larger land holding also increase home consumption from fruit production. Overall, the results seem to suggest those with some land but not large quantities are most affected by OPORTUNIDADES in terms of home production.

For agricultural spending, all land categories show positive coefficients, but few with amounts that are significantly different from zero. Smallholders have a greater probability of spending and those with larger holding spend more per capita in October 1998. While the numbers indicate an increase in agricultural spending across the board, it is hard to discern any clear patterns across the land categories.

The analysis of PROCAMPO presented in the previous section indicates that the program had a multiplier effect and suggests that this comes from the program enabling households to overcome liquidity constraints. If this is the case, the expectation is that the program increased spending in inputs and investment in new activities. Respondents from the ejido surveys used by Sadoulet, de Janvry and Davis (2001), do say that they use PROCAMPO transfers to increase inputs (in 44 percent of cases) and begin to purchase input (in 17 percent of cases). They note however that the size of transfers is insufficient for them to change cropping patterns of in area planted. In attempt to determine if farmers responses are reflected in the data and to identify if the mechanism through which the multiplier effect was created, Sadoulet, de Janvry and Davis (2001) analyze how transfers influence agricultural activities. Results are presented in Table 6.

The results indicate that every PROCAMPO peso generates, at the mean value for households, 0.33 pesos of agricultural income. Interaction terms are included in the analysis to determine which factors combine with PROCAMPO transfers to induce the largest impact. These terms suggest that households with irrigated land, with access to technical assistance and without access to credit are able to take the greatest advantage of PROCAMPO transfers and increase agricultural income. Setting credit access to zero increases the multiplier to 0.51 and reducing access to technical assistance lowers it to 0.23. Along with enhancing agricultural income, the

results indicate PROCAMPO receipt is associated with a positive increase in the probability of using chemicals in production leading to around a 4 percent increase in use (data on the amount of chemicals used is not available.) Finally, a peso of PROCAMPO transfers is associated with a 0.28 peso increase in livestock income suggesting that along with crop production, livestock also provides higher returns when PROCAMPO transfers are provided.

Table 6: Effect of PROCAMPO on agricultural activities

	Coefficient (Multiplier)	P-value
Change in agricultural income		
PROCAMPO transfer	0.19	(0.31)
PROCAMPO*irrigated land	0.23***	(0.00)
PROCAMPO*rainfed land	-0.01*	(0.10)
PROCAMPO*technical assistance	1.44***	(0.00)
PROCAMPO*access to credit	-0.99***	(0.00)
PROCAMPO at mean value of exogenous variables	0.33**	(0.02)
PROCAMPO at mean value, no credit	0.51***	(0.00)
PROCAMPO at mean value, no technical assistance	0.23*	(0.10)
Change in use of chemicals		
PROCAMPO transfer	0.00016**	(0.02)
Average value without PROCAMPO	0.486	
Average value with PROCAMPO	0.526	
Change in livestock income		
PROCAMPO transfer	0.28*	(0.07)

Source: Sadoulet, de Janvry and Davis (2001) Table 5

Notes: *significant at 10%, **significant at 5% and ***significant at 1%. P-values in parentheses.

Although PROCAMPO focused on compensating farmers for lower expected staple prices, implicit in the trade agreement and PROCAMPO was the expectation that Mexican agriculture, in general, would shift from staples to more labor-intensive fruit and vegetable production and staple producers, in particular, would shift their production to these products (Burfisher, Robinson and Thierfelder, 1991, as reported in Josling, 1992). While data show an increase in fruit and vegetable production in the post-NAFTA period, there is some question about whether PROCAMPO recipients made the shift to these higher value crops and if so which PROCAMPO recipients were able to make such a shift. Two sets of data are available to assess the change of agricultural patterns of PROCAMPO recipients: the PROCAMPO administrative data and the GEA data collected in 2005 as part of an analysis of the PROCAMPO program. Each of these in considered.

The PROCAMPO administrative data provided by ASERCA includes information on the crops planted by recipients on eligible plots in the period in which they were receiving PROCAMPO. With this data, it is possible to determine whether PROCAMPO recipients have continued to produce staples in the post-PROCAMPO period. Of course, it would be expected that some households would continue to produce staples since they would have a comparative advantage in their production. Furthermore, NAFTA did not have the dramatic effect on maize prices that was anticipated and in fact in recent years the price of maize has gone significantly higher due to increased demand for maize for ethanol production. However, given the incentives to produce

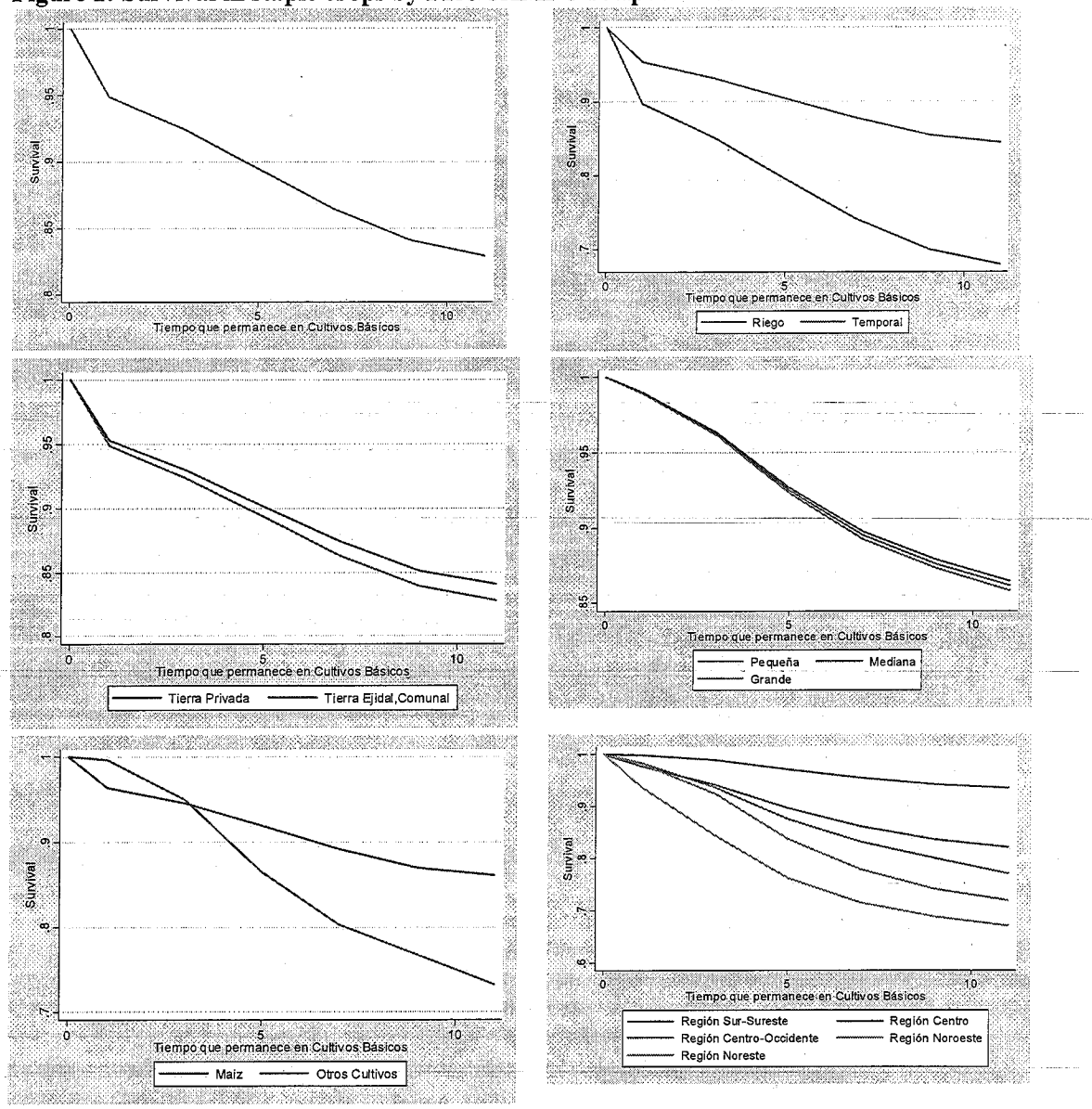
higher value vegetables and fruits, the expectation is that a significant share of households may have shifted to nonstaple production.

The appropriate way to analyze this type of data is through survival analysis (also known as duration models) Survival models are used in the medical profession to determine what characteristics of individuals make them more likely to survive a disease for a longer period of time. Similarly, such a model could be used to determine whether and how quickly PROCAMPO recipients shifted out of staples and which characteristics of PROCAMPO recipients make them more likely to "survive" longer in staple production. The benefit of such an analysis is that it provides a sense of which households have been unable to alter production and, over a decade after NAFTA, find themselves in the same position as prior to the agreement. This analysis was conducted by Yunez-Naude et al (2007) and details can be found in that document. Results are presented in the Figure 1.

The first figure indicates that twelve years after the PROCAMPO program was initiated over 80 percent of recipients are still producing staples on their land suggesting few households are shifting production. These results are confirmed by Gonzales (2007) who, using the 2005 GEA data, also finds that over 80 percent of PROCAMPO lands remain in staple production eleven years after the initiation of the program. Of the 14 million hectares initially in PROCAMPO, these results show that nearly 12 million remain in staple production and of the three million producers 2.5 million continue to use PROCAMPO land for staple production. As can be seen in the first panel of Figure 1, after an initial drop of 5 percent at the beginning of PROCAMPO, a shift of about 1 percent per year occurred over the following 10 year.

The remaining figures identify difference in survival across categories of recipients. Irrigation is a clear factor influencing the shift from staples to other crops. Those with irrigation were about15 percent more likely to have changed over the period compared to those with rainfed plots. Somewhat surprisingly there is little difference between ejido sector and private lands even though it might be expected that those with private lands would be more likely to shift. More surprising is that land size seems to matter little. Although land is significant in the regression, the magnitude of the difference is very small with larger land holdings only moderately different from smaller ones in changing out of staples. In terms of crops planted, although there was a larger initial shift out of maize production the change was much more dramatic for recipients producing other crops. The producers of the other eight staples are twice as likely (14 percent versus 27 percent over the entire period) to have switched production in the post-PROCAMPO period. This may be linked to differences in prices for these goods over the period. Finally, regional differences are rather dramatic with those in the northern region of Mexico much more likely to switch than in the south with the other regions in between. The dramatic change in the north may be due to greater market access to US markets, because of differences in the level of development of the regions or a combination of the two. The very limited changes in the poorer south may be an indication of the use of staples for food security and a reluctance to switch out of staple production given concerns over ensuring adequate food access.

Figure 1: Survival in staple crops by PROCAMPO recipients 1994-2005



Source: Yunez-Naude et al (2007)

The ASERCA administrative data does not include complete data on households that decided to capitalize their PROCAMPO payments so it is not possible using that data to identify whether those households were more likely to stay in staple production. GEA (2006) reports 20 percent of PROCAMPO recipients had capitalized their payments and the 2005 GEA data does distinguish between PROCAMPO traditional and Capitaliza recipients. This data can, therefore, be used to analyze the productive activities of PROCAMPO Capitaliza households. An analysis of PROCAMPO households suggest that households that enter the Capitaliza program are less

likely to be female, have less land area, are more likely to belong to producer organizations, have less land in the program, have less irrigated land, are not involved in nonagricultural activities and have limited access to migrant networks.[10] The results on land area are not surprising given the program focused recipients with less than 5 hectares of land. The remaining results suggest participants tended to be those that are dedicated to agriculture and not other activities. As noted above, the GEA data indicates that about 80 percent of PROCAMPO recipients remain in staple production. Given the characteristics of the Capitaliza households, it might be expected that they would be more likely to switch out of staples. The data indicate though that they do switch, but not substantially more than the PROCAMPO traditional households. Eighty-four percent of traditional recipients remain using their PROCAMPO land for staple production while 75 percent of Capitaliza recipients do as well.

Overall the results of the analysis indicate that both programs had an influence on the productive activities of households although did not lead to dramatic shifts in production. The data however cover different populations. To compare the impact of PROCAMPO and OPORTUNIDADES on agricultural spending and investment, it is possible to use the OPORTUNIDADES data since it does identify PROCAMPO recipients. As noted previously, the problem with using this data is that since PROCAMPO is not randomly assigned it may be that the beneficiaries are fundamentally different from nonbeneficiaries leading to biased estimates of impact. Since PROCAMPO placement was based on household production of staples, it is likely that recipient households are fundamentally different from nonrecipients in the OPORTUNIDADES data set. In order to examine how PROCAMPO recipients differ from nonrecipients, regression were run on the baseline OPORTUNIDADES data using the same set of control variables used for the analysis of OPORTUNIDADES as well as a dummy variable for PROCAMPO. This provides an estimate of how PROCAMPO recipients differed from nonrecipients in terms of key outcome variables prior to the initiation of OPORTUNIDADES. Unfortunately, all of the outcome variables available in the later data sets were not available in the 1997 census data or the March 1998 baseline survey so only those available are presented.

Table 7 presents the results of the analysis. The results show that PROCAMPO recipients clearly are more agriculturally oriented than nonrecipients in that they produce more food groups and more food types for home consumption than nonrecipients and are more likely to consume cereals, beans and meat from home production. They are also much more likely to use land for production and use more land and are also more likely to own more livestock and have more livestock. The reported marginal effects should not be interpreted as the impact of the PROCAMPO program since the results are likely to be biased by virtue of the fact that PROCAMPO recipients differ from other households (although the outcome variables could certainly be influenced by the program). It does show clearly that these are households that are dedicated to agriculture.

[10] The authors are grateful to Mario Gonzalez for providing the prepared GEA data for analysis. The analysis involved running a probit regression on the probability of a PROCAMPO recipient having entered the Capitaliza program. The regression included a standard range of household characteristics. The mentioned variables are those that were significant in this analysis.

Table 7 : PROCAMPO recipients prior to OPORTUNIDADES

		PROCAMPO	
	March-98	Marginal effect	p-value
Number of food groups		0.1487***	0.00
Number of foods		0.1508***	0.00
Cereals from own production		0.0757***	0.00
Beans from own production		0.0649***	0.00
Fruits/vegetables from own production		0.0192	-0.30
Meat from own production		0.0381***	0.00
Land used		0.4849***	0.00
Per capita land use		0.6242***	0.00
Livestock owned		0.0565***	0.00
Per capita livestock owned		0.1417***	0.00

Source: Authors' estimation
Notes: *significant at 10%, **significant at 5% and ***significant at 1%.

The strong focus of PROCAMPO recipients on agricultural production suggests that they may react differently to receiving OPORTUNIDADES' transfers than other households. To examine this hypothesis, we can rerun the regression in Table 5 with a variables that identify those households that only received PROCAMPO and those that received both PROCAMPO and OPORTUNIDADES (controlling for other factors as previously including receipt of only PROCAMPO.) With these mutually exclusive groups, we can test whether the impact on one group differed from the other. Table 8 presents the results of the analysis on the agricultural outcome variables.

The results indicate that OPORTUNIDADES did have the effects highlighted in Table 5 even for those households that were not part of PROCAMPO. Most of the key results remain the same indicating a broad effect of the program on agriculture. Test of difference of the coefficients on those that only received OPORTUNIDADES and those that received both programs, however, show some interesting differences. First, in October 1998 those that receive both programs appear to have increased production more in staples (cereals and beans), but less in meat. In May of 1999, there appears to again be a greater emphasis in increasing staples by the recipients of both programs relative to only OPORTUNIDADES recipients. These results reflect the staple orientation of PROCAMPO recipients. There also appears to be greater number of food groups grown in May 1999 which is the results of more vegetable and more meat production at home for recipients of both programs. However, the strongest and most compelling results appear to come through from the analysis of the probability of agricultural spending and the amounts spent on agricultural production. In both seasons, OPORTUNIDADES had a much greater impact on the agricultural spending by households that were PROCAMPO recipients than those households that were not in PROCAMPO. Marginal effects are significantly different between the two groups and the magnitudes of the results for recipients of both programs are much larger. The results indicate that households that were dedicated to staple production tend to use transferred cash more for agricultural inputs, and thus intensification of production, than other households. The type of household receiving transfers appears to influence how it is used.

Table 8: OPORTUNIDADES, PROCAMPO and agricultural production

	OPORTUNIDADES		BOTH		OPORT= BOTH
October-98	Marginal effect	p-value	Marginal effect	p-value	p-value
Consumes from own production	0.0466**	0.02	0.0708***	0.00	0.12
Per capita value home production	5.5360***	0.00	7.0641***	0.00	0.31
Number of food groups	0.1225***	0.00	0.1489***	0.00	0.39
Number of foods	0.1401***	0.00	0.1570***	0.00	0.61
Cereals from own production	0.0327	0.19	0.0693***	0.01	0.07
Beans from own production	0.0124	0.21	0.0298**	0.01	0.05
Fruits from own production	0.0498**	0.05	0.0527*	0.05	0.92
Vegetables from own production	0.0022	0.87	0.0175	0.31	0.20
Meat from own production	0.0214**	0.03	0.0047	0.67	0.06
Reports agricultural spending	0.0359	0.13	0.2709***	0.00	0.00
Amount spent per hectare	104.7921	0.36	991.0837***	0.00	0.00
Amount spent per capita	0.0153	0.16	0.1111***	0.00	0.00
May-99					
Consumes from own production	0.0518***	0.01	0.0665***	0.00	0.32
Per capita value home production	3.177	0.15	6.2121**	0.01	0.07
Number of food groups	0.1035**	0.02	0.1599***	0.00	0.07
Number of foods	0.1160**	0.02	0.1704***	0.00	0.09
Cereals from own production	0.0363	0.19	0.0701**	0.02	0.11
Beans from own production	-0.0015	0.84	0.0105	0.22	0.06
Fruits from own production	0.0384*	0.07	0.0295	0.20	0.48
Vegetables from own production	0.0258	0.20	0.0456**	0.05	0.22
Meat from own production	0.0069	0.34	0.0229**	0.02	0.05
Reports agricultural spending	0.0242	0.30	0.1743***	0.00	0.00
Amount spent per hectare	289.5228	0.15	1,088.3993***	0.00	0.00
Amount spent per capita	0.0159	0.25	0.0947***	0.00	0.00

Source: Authors' estimation

Notes: *significant at 10%, **significant at 5% and ***significant at 1%.

As with overall welfare, a final way to compare the impact of the two programs on agricultural production is using the 2002 ENRHUM. The same methods described before are employed for the analysis and the same caveats noted previously apply (see Section 4). Table 9 presents the results of the matching procedure. The estimates suggest that PROCAMPO has a significant impact on gross crop income and a positive, but insignificant, impact net crop income (gross income minus costs). The probability of using all inputs and the pesos spent on each activity are positively and significantly related to participation in PROCAMPO. PROCAMPO does not, however, appear to impact investment in agricultural production or the amount invested. This again suggests that PROCAMPO role in overcoming constraints to spending but only limited impact on investment. OPORTUNIDADES does appear to lead to a greater probability of spending on fertilizers and pesticides as well as on using family labor in agricultural production but is not positively related to the amount spent or income earned from agricultural activities. As

noted in the previously discussed results, it seems to induce greater participation, but not greater levels of activity.

Table 9: Program impacts on agricultural production, 2002

	OPORTUNIDADES	PROCAMPO
Gross crop income	-2056	3653***
	(-1.420)	(3.944)
Net crop income	2505	1069
	-(1.264)	(0.536)
Fertilizer and pesticide use	0.104***	0.414***
	(2.894)	(11.924)
Pesos spent on fertilizer and pesticides	-3728*	1914**
	(-1.837)	(2.274)
Hired labor	0.011	0.222***
	(0.332)	(6.646)
Pesos spent on hired labor	-569	656***
	(-1.272)	(3.449)
Family labor used	0.076**	0.452***
	(2.165)	(14.701)
Value of family labor used	449	2338***
	(1.378)	(6.336)
Machinery use	-0.006	0.366***
	(-0.019)	(10.570)
Pesos spent on machinery use	-199	3307***
	(-0.551)	(7.207)
Agricultural asset investment	0.014	-0.029
	(0.414)	(-0.767)
Amount invested in assets	1700	1346
	(0.888)	(0.526)

Source: Calculated with the research assistance of Lisa Pfeifer using the ENRHUM data
Notes: t-stats in parentheses. Results from the stratification method shown. *significant at 10%, **significant at 5% and ***significant at 1%.

6. OPORTUNIDADES and PROCAMPO and human capital investment

Given that the receipt of OPORTUNIDADES transfers was linked to education and health conditions, the expectation is that the program would have a significant impact on related outcomes. Table 6 presents results of the analysis of education outcomes from a study by Schultz (2004). For primary school, the results indicate an increase in enrollment for females and males of 0.92 percent and 0.80 percent respectively. This is an increase from already high initial enrollment rates of 94 percent at the primary school level. Increases at the secondary level are much more dramatic. Female enrollment increases by 9.2 percent from an initial rate of 67 percent and boys 6.2 percent from an initial rate of 73 percent. The program appears then to increase not just enrollment of both genders but reduce the gender gap in secondary education.

Based on overall estimates of the impact, Schultz (2004) is able to extrapolate the long-term effects of the program on schooling enrollment. These estimates are provided in the lower panel of Table 10. Overall the expected increase in years enrolled is 0.66 an approximate which given

average education around 6.7 years in the baseline suggests an increase of 10 percent. The impact on the years of female enrollment is greater than male enrollment again highlighting the program had a greater effect on females.

Table 10: OPORTUNIDADES and schooling outcomes

	Primary		Secondary	
Prob of enrollment (probit)	**Female**	**Male**	**Female**	**Male**
Net program impact	0.92%***	0.80%***	9.23%***	6.23%***
	(0.003)	(0.002)	(0.000)	(0.003)

Cumulative enrollment effect	**Estimates**
Grade completed	
1	0.020
2	0.042
3	0.041
4	0.080
5	0.100
6	0.121
7	0.125
8	0.129
Expected total years	0.66
Years enrolled female	0.72
Years enrolled male	0.64

Source: Schultz (2004) Tables 10 and 11, Double difference panel data

Notes: P-values in parentheses. *significant at 10%, **significant at 5% and ***significant at 1%.

Along with increased enrollment there is also evidence suggesting that OPORTUNIDADES has influenced progression through school. Behrman, Sengupta and Todd (2001) report that OPORTUNIDADES led to earlier school entry, lower dropouts, less repetition and more reentry. Particularly important is the influence of the program on the transition from primary to secondary school where the progression rate is 11 percent higher for recipient households. Correspondingly, dropouts among recipients are 29 percent lower at sixth grade. Results for primary school across gender are similar, but for secondary school it appears that boys are less likely to dropout and more likely to reenter than girls as a result of the program in the second and third years of junior secondary school. This is the case even though payments to girls are higher. Taken together, the results clearly indicate a positive approach of the program on education outcomes.

In terms of health, Table 11 presents results from two papers by Gertler (2000) and Gertler (2004) on the health impact of OPORTUNIDADES. The results clearly show a number of significant impacts on health outcomes. Rates of visit to public health centers have increased by 2.09 additional visits per locality from a pre-program rate of 8 daily visits. The incidence of illness among children declined by a quarter and this has resulted in improved health outcomes. There is a significant reduction of anemia among children 12-48 months old and nearly a centimeter increase in height among 12-36 month olds. Adults also appear to have a lower rate of difficulty with illness and are able to walk further without feeling poorly.

Table 11: OPORTUNIDADES and health outcomes

	Estimate	p-value
Health care facility utilization		
Visit rates to public clinic	2.09*	0.067
Children's health outcomes		
Incidence of illness	-25.3%***	0.000
Height (cm)	0.96***	0.004
Stunting	-8.6%	0.495
Anemia	-25.5%**	0.012
Adult health outcomes (15-50)		
Days of difficulty with illness	-19.0%	0.110
Kilometers able to walk	7.5%***	0.000

Source: Gertler (2004) and Gertler (2000), various tables

Notes: *significant at 10%, **significant at 5% and ***significant at 1%.

These results focused on the initial data collected on OPORTUNIDADES as part of the experimentally designed evaluation. The experimental data could not be easily used for evaluations after the control households were included in the program in late 1999. An additional data collection occurred in 2003 that allowed for evaluation using a quasi-experimental approach. An evaluation by Behrman, Parker and Todd (2004) evaluated a number of education outcomes to confirm the initial results and identify longer term impacts of the program. The results suggest that those children aged 0-2 in 1997 that received nutritional supplements were slightly more likely to enter school on time and more likely to progress. Children age 3-5 at the initiation of the program did not receive the nutritional supplement and had not advanced far in schooling by the 2003 study period. They were not found to be much influenced by the program except for some evidence of lower failing and greater progression. Children that were age 6-9 in 1997 who had already entered school when the program started were found to have higher schooling attainment.

Results on the impact of PROCAMPO on human capital investment have not been easy to come by due to data limitations. As with overall welfare and agricultural outcomes, it is possible to examine whether PROCAMPO recipients respond differently to OPORTUNIDADES than nonrecipients again using the fact that some households get both. Handa et al (2006) have conducted this analysis and the results are presented in Table 12. As a first step, again the results for the baseline are examined to determine if PROCAMPO recipients differ from other households. The results indicate that at baseline, and after controlling for differences in household composition and assets, PROCAMPO households have lower enrolment rates for boys. The lower school enrolment may be related to on-farm productive activity, and raises the key question of whether OPORTUNIDADES will have a different impact among these households compared to OPORTUNIDADES eligible households who do not receive PROCAMPO.

Table 12: OPORTUNIDADES, PROCAMPO and human capital outcomes

Baseline: March 1998	OPORTUN-IDADES	PROCAMPO	BOTH	OPORT= PROC	OPORT= BOTH	PROC= BOTH
Enrollment 13-15 year olds (logit)	0.170**	0.021	-0.153	0.172	0.077*	0.451
	(2.29)	(0.19)	(1.14)			
Enrollment boys (logit)	0.258***	-0.038	-0.137	0.032**	0.091*	0.736
	(2.69)	(0.27)	(0.81)			
Enrollment girls (logit)	0.042	0.125	-0.185	0.55	0.329	0.295
	(0.45)	(0.89)	(1.08)			
Health check-up (logit)	0.028	0.012	0.141	0.922	0.646	0.704
	(0.31)	(0.07)	(0.72)			

Differenced (fixed effects) results 1999-1998	OPORTUN-IDADES	BOTH
Enrollment 13-15 year olds (logit)	0.072***	0.025
	(3.97)	(1.38)
Enrollment boys (logit)	0.067***	0.01
	(3.37)	(0.40)
Enrollment girls (logit)	0.091***	0.023
	(4.42)	(1.02)
Health check-up (logit)	0.118***	-0.042***
	(8.37)	(2.80)

Fixed effects estimates per capita land 1999-1998	OPORTUN-IDADES	Land	OPORT*Land
Enrollment 13-15 year olds (logit)	0.055***	0.111**	-0.026
	(3.40)	(2.53)	(0.60)
Enrollment boys (logit)	0.035*	0.099**	-0.020
	(1.95)	(1.98)	(0.41)
Enrollment girls (logit)	0.068***	0.087	-0.052
	(3.48)	(1.57)	(0.95)
Health check-up (logit)	0.132***	0.092***	-0.101***
	(10.12)	(2.34)	(2.45)

Source: Handa et al (2006) Tables 3, 5 and 6
Notes: z-statistics in parentheses. P-values for test of equality of coefficients. *significant at 10%, **significant at 5% and ***significant at 1%.

The second panel of Table 12 presents the impact of OPORTUNIDADES on the outcome variables using a household fixed effect model which exploits the panel nature of the data. The fixed effects model allows for unbiased estimates since it removes any unobservable differences between control and treatment prior to program implementation. Of the human capital variables only health check-ups is significantly different from zero. This implies that for these key OPORTUNIDADES related outcomes, the change in demand between 1998 and 1999 is the same among OPORTUNIDADES only and OPORTUNIDADES /PROCAMPO households with the important exception of children's health check-ups, where the change is significantly smaller among the latter group. For this particular outcome then, there appears to be a negative interaction effect of participating in both programs.

The results suggest that OPORTUNIDADES has a muted impact in terms of health care among beneficiaries who also participate in PROCAMPO, presumably due to differences in the shadow price of time between agricultural and nonagricultural households. To further examine this issue, Handa et al (2006) drop the indicator of PROCAMPO eligibility and directly testing whether

OPORTUNIDADES households with land holdings show a different behavioral response to that program relative to those who do not hold land. The results of this analysis are presented in the third panel of Table 12. The parameter of interest is the interaction between land holdings (per capita) and OPORTUNIDADES, and these are virtually all negative, implying a muted effect of OPORTUNIDADES as landholdings increase. These interaction effects are insignificant for school enrolment, but are significant for health check-ups, which is consistent with the other results. Note that in all specifications the direct impact of PROGRESA is positive and significant as we would expect, as is the direct impact of per capita land size.

The results beg the question of why is it harder for agricultural households to fulfill the health condition, but not the schooling condition. Handa et al (2006) argue that communications with teachers in OPORTUNIDADES schools suggest that they adjusted their expectations in terms of attendance and home work around the agricultural cycle to in order to make school and farm work more compatible. Similar sensitivity among nurses and doctors at health posts during field visits were not found. Moreover, the health check-ups for infants typically require the time input of an adult whose opportunity cost is likely to be high for agricultural households, thus increasing the full cost of these visits. Since caring for children age 2-5 is more compatible with on-farm work, these results are also consistent with the hypothesis that the time cost of health visits are greater among agricultural households, and thus leads to a more muted response to OPORTUNIDADES than nonfarm households.

Table 13: Program impacts on human capital, 2002

	OPORTUNIDADES	PROCAMPO
Enrollment of children 5-18	0.014	0.013
	(0.820)	(0.563)
Children 13-15	0.079**	0.021
	(2.017)	(0.328)

Source: Calculated with the research assistance of Lisa Pfeifer using the ENRHUM data

Notes: t-stats in parentheses. Results from the stratification method shown. *significant at 10%, **significant at 5% and ***significant at 1%.

Finally, we again turn to the ENRHUM data to examine the impact of the two programs on human capital outcomes. Unfortunately, data on health outcomes is unavailable although there are data on school enrollment. Following the same procedure as before (and recalling the same caveats), Table 13 presents the results of the analysis of the data. The result confirm those found elsewhere that OPORTUNIDADES does not have an overall impact on enrollment, but does increase enrollment (by 7.9 percent) for the children in the key transition ages between primary and secondary school. PROCAMPO is found to have no influence on school enrollment.

6.1 Human capital investment and economic activity in the long run

By focusing on human capital investment, the OPORTUNIDADES program will influence the economic choices of the rural poor. In particular, investment in human capital alters the long-run asset position of the household, especially the second generation which receives the bulk of the benefits. The influence this investment has on rural income-generation depends largely on the returns to education for rural households. Because of the detailed data collected by OPORTUNIDADES to determine eligibility, the administrative data is rich enough to analyze, at least to a certain extend, the income-generating activities of recipient households. Based on the

information available in the ENCASEH (the OPORTUNIDADES census), income aggregates can be created and broken down into five categories: agricultural wage employment, nonagricultural wage employment, self employment (which includes agricultural and nonagricultural self employment), transfers and other income.

Winters and Chiodi (2007) have initiated this analysis and created these income aggregates using the OPORTUNIDADES ENCASEH data from 1996 through 2000 when the majority of rural households entered the program. The categories of income sum to total income of the household in the year prior to the survey. Since the income comes from different years depending on entry into OPORTUNIDADES (1996-2000), monetary values are put into real 2000 pesos. The median value for income is approximately 13,000 pesos per household and the mean 18,000 pesos per household.[11] Table 14 shows the breakdown of activities in terms of percent participating and income earned. Note that for participation percents do not add up to 100 percent since some households are engaged in multiple activities. Agricultural wage labor is the most common activity of OPORTUNIDADES participants with over half participating. This is followed by transfers, self employment (including farming) and nonfarm wage employment. Although having the lowest participation rate, nonfarm wage employment represents about a quarter of income and those that earn from that activity earn on average over 50 percent more than agricultural wage earners and about twice as much as the self employed.

The approach taken to systematically examine the household characteristics linked to rural income generating activities is to analyze the factors that influence participation in individual activities then consider the level of income from that activity for those who participate. The first stage of the analysis uses a probit regression model while the second stage uses a Heckman two-stage procedure, to deal with self selection into these activities. The detailed results of this analysis are presented in Winters and Chiodi (2007). Since our interest is principally on how investment in education may influence the economic choices of beneficiaries, in Table 8 the results for that part of the analysis are presented. The default category is no education and the results show clearly that as education increases households tend to shift out of agricultural wage activities and into nonfarm wage activities. Lower levels of education (some primary and complete primary) are also associated with greater participation in self employment and transfers. The results paint a picture of the poorest mostly involved in agricultural wage, the minimally education in self employment, transfers and to a certain extend nonfarm wage employment and the most educated in rural nonfarm employment. Looking at the bottom panel clearly explains why this is the case. The income generated from secondary education clearly comes from nonfarm wage employment with a return of nearly 4000 additional pesos which is equivalent to around 30 percent of median income of OPORTUNIDADES participants. Having a primary and secondary level of schooling clearly appears to pay off even for the poorest households in Mexico.

[11] This corresponds to a per capita median income of 2,800 pesos per year (approximately US$270/capita per year) and a mean per capita income of 3,700 pesos per year (approximately US$355/capita per year).

Table 14: Rural household income-generating activities and schooling

Mean values	Agricultural wage employment		Non-farm wage employment		Self employment		Transfers	
Participation	52.7%		19.6%		28.8%		32.6%	
Average income	7511		4388		3259		1797	
Share of income	41.4%		24.2%		18.0%		9.9%	
Average income of participants	14246		22345		11330		5510	
Participation (probit)	Marginal effect	Z-stat	Marginal effect	Z-stat	Marginal effect	Z-stat	Marginal effect	Z-stat
Some primary education	-3.89%***	-12.48	1.08%***	4.61	4.13%***	14.96	4.69%***	16.31
Primary education	-6.29%***	-15.18	2.86%***	9.14	3.18%***	8.42	2.17%***	5.48
Some secondary or higher	-7.66%***	-13.60	7.04%***	15.78	-0.66%	-1.25	-8.15%***	-14.13
Income level (heckman)								
Some primary education	-433***	-3.99	587***	2.38	586***	4.07	335*	1.81
Primary education	-1097***	-7.00	1023***	3.09	947***	5.24	-579**	-2.28
Some secondary or higher	-1762***	-8.30	3938***	8.51	2336***	8.55	-409	-0.86

Source: Based on Winters and Chiodi (2007) Tables 1 and 3

Notes: Monetary values in 2000 pesos *significant at 10%, **significant at 5% and ***significant at 1%.

Given that a primary focus of OPORTUNIDADES is on improving schooling outcomes and the fact that it appears to have been successful in improving schooling enrolment, attendance and progression, these results have important implications for the program and government policy. The results suggest that with increased schooling the expectation is that there will be a shift away from agricultural wage employment and towards more self employment and nonagricultural wage employment, particularly for those that complete some secondary level schooling. Rural nonagricultural employment in particular appears to be a key path out of poverty given the higher income to those with some secondary level education. This assumes, of course, that opportunities to enter into nonagricultural wage employment will be available to the newly educated. If not, the benefits of increased schooling in terms of income-generation may be limited at least for those who remain in rural areas. For others, migration to areas where income gains from schooling are higher may be the only option. Given the importance of schooling in the OPORTUNIDADES program, we now consider these issues further.

There is a question of whether providing education to the asset poor alone is sufficient to expand their opportunities. To explore this possibility, the probit regression presented in Table 14 was rerun to include interaction terms between education levels and the *puntaje* value for the household to determine if low asset position inhibits participation in wage activities even when the household has higher education levels. Note that a higher puntaje implies a lower asset position. The results of the probit are reported in Table 15. The signs on the puntaje variable indicate, as noted earlier, that poorer households have a higher probability of participating in agricultural wage activities and relatively wealthier households a higher probability of participating in nonagricultural wage activities. The direction of results on the schooling variables remain the same although the magnitude is clearly higher while the interaction terms are positive for agricultural wage employment and negative for nonfarm wage employment. While the magnitudes of the marginal effects still imply education is negatively associated with agricultural wage and positively associated with nonfarm wage, the signs of the interaction terms indicate that the influence of education on activity participation is significantly lower for households with a lower asset position thus suggestion the need to invest in other assets in combination with education.

Table 15: Schooling and asset position

	Agricultural wage		Non-farm wage	
Participation (probit)	Marginal effect	Z-stat	Marginal effect	Z-stat
Some primary education	-5.73%***	-10.73	2.52%***	5.76
Primary education	-12.14%***	-19.96	8.34%***	16.06
Some secondary or higher	-26.98%***	-40.89	21.98%***	34.41
Puntaje	5.41%***	32.02	-1.78%***	-12.28
Some primary education*puntaje	0.73%***	3.73	-0.53%***	-3.17
Primary education* puntaje	2.72%***	11.47	-2.19%***	-11.18
Some secondary or higher*puntaje	9.18%***	28.15	-4.72%***	-18.65

Source: Based on Winters and Chiodi (2007) Table 6

Notes: *significant at 10%, **significant at 5% and ***significant at 1%.

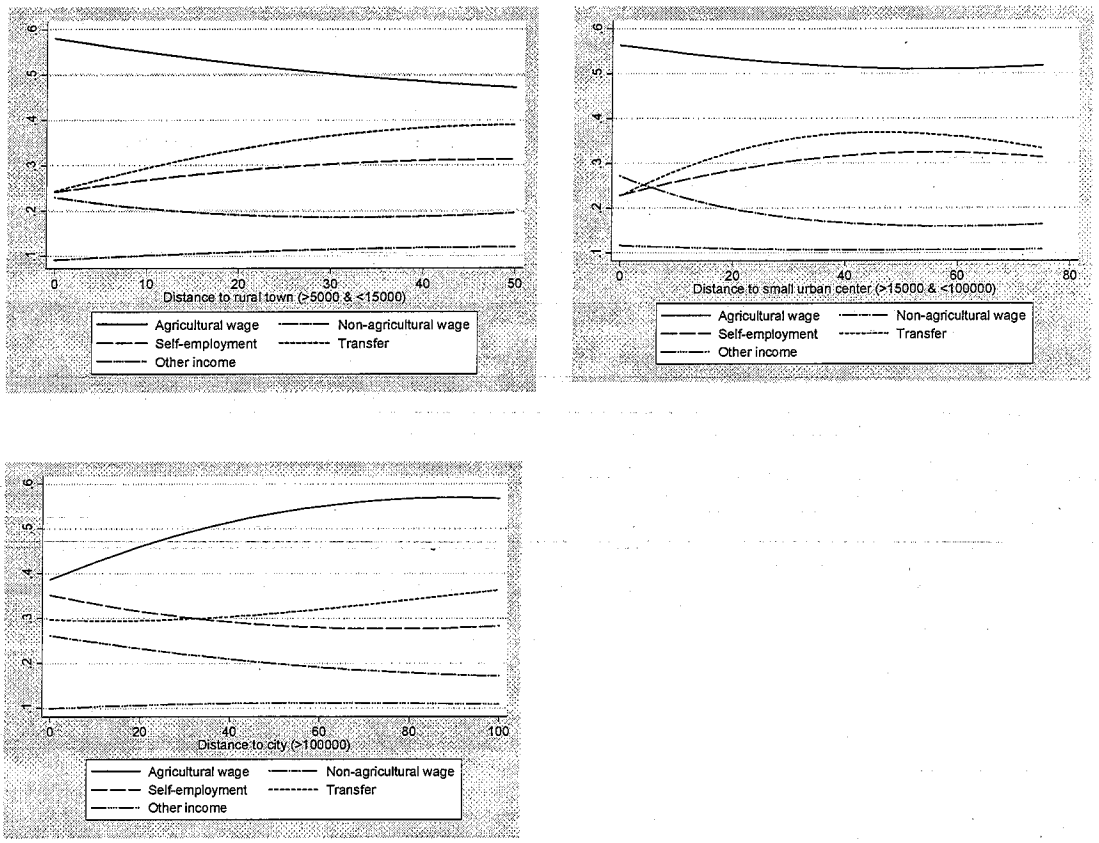
Along with assets, the location of households relative to population centers is expected to have a significant impact on the predominant activities in an area (Fafchamps and Shilpi, 2003). The importance of activities may vary depending on the size of population centers and three types of population centers are identified, i) rural towns with populations between 5,000 and 15,000, ii) small urban centers with populations between 15,000 and 100,000 and iii) cities with over 100,000 people. The analysis of the distance of households to these centers is complicated by the fact the relationship is likely to be nonlinear and the presence of one population centre may influence the effect of other centers. As such, the distance to each of these centers is modeled using a nonlinear specification—namely, linear, quadratic and cubed terms—as well as interaction terms between each of the possible combinations of population centers.

Figure 2 present the relationship between distance to towns, small urban centers and cities, and the probability of participating in each of the income generating activities. As can be seen, moving away from a rural town leads to a significant decline in the probability of agricultural employment from approximately a 60 percent probability to less than 50 percent. Similarly, being further from a small urban centre reduces the probability of agricultural wage employment although this is less dramatic. On the other hand, the further away a household is from a city the much greater the probability of agricultural employment. Taken together the results indicate a concentration of participation of agricultural employment near smaller population centers and away from larger centers. For nonagricultural wage employment, there is a decline in the probability of participation as you move away from any population centre. This decline is greatest for small urban centers and cities. Participation in self-employment activities slightly increase as you get further from smaller population centers probably due to the increased emphasis on agriculture in remote areas. There is a slight decline in self-employment participation as you get further away from cities most likely because of a decline in nonagricultural self-employment activities. The results clearly show the importance of location on the probability of participating in certain activities.

A similar analysis on income-generation and distance to urban centers has also been completed. The results do not show any dramatic changes in the income from activities based on the distance from population centers. There is, however, a general downward trend for income from all activities as you move further away from cities suggests, not surprisingly, that income earnings

are lower in less populated areas. A moderate income increase for both agricultural and nonagricultural wage earners away from rural towns suggest that being near a town has little benefit for wage earners. Overall the results indicate that location seems to matter more for participation in activities as opposed to the returns to those activities.

Figure 2: Probability of participation and distance to population centers

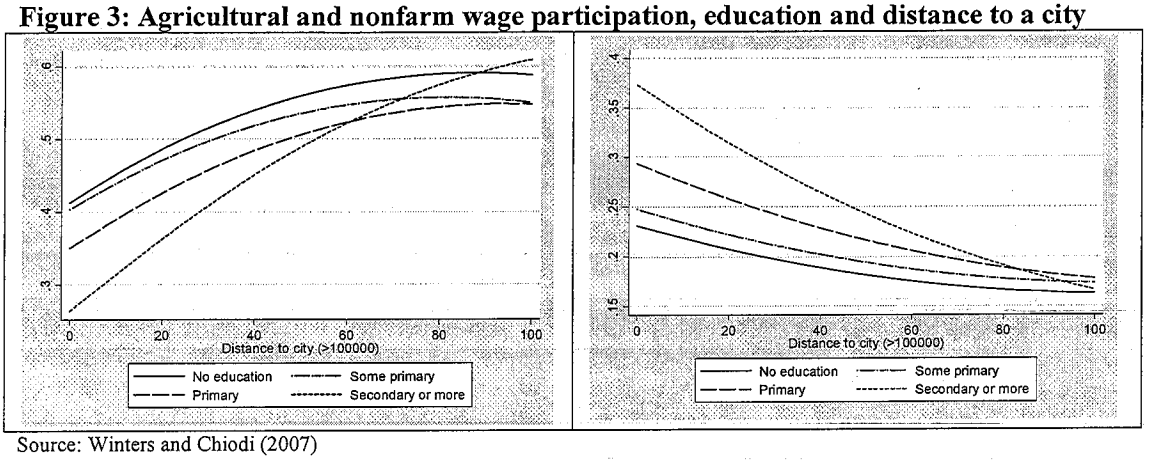


Source: Winters and Chiodi (2007)

To determine the relationship between education and distance to urban center, a specification of the model was also run with these interaction terms. The results are presented in Figure 3 with agricultural wage participation shown in the first figure and the nonfarm wage participation in the second. The results clearly show that participation in agricultural wage is negatively related to distance to cities for all activities and positively for nonfarm wage for all activities. The results are most dramatic, however, for secondary education where the slopes of the curves are steepest. These results, along with similar results for smaller urban centers, indicate that for household heads with secondary education the probability of participating in agricultural wage employment decreases with distance from towns, but increases with distance from small urban centers and cities. For nonagricultural wage employment, the probability of participation declines more quickly with distance to small urban centers and cities for those with some secondary education

compared to other levels of education. Taken together, the results suggest that the returns from secondary education further from urban areas may be found in highly productive agricultural employment; however, those with secondary education are more likely to find opportunities near urban centers.

Figure 3: Agricultural and nonfarm wage participation, education and distance to a city



Source: Winters and Chiodi (2007)

Overall, this set of analyses of the income-generating activities of OPORTUNIDADES' recipients indicates that OPORTUNIDADES is not likely to be neutral in its influence on economic activities. OPORTUNIDADES has a strong emphasis on increasing the education of the rural population, particularly the children of the poor, and has been shown to be effective in improving education outcomes. Now that the program has been in place for nearly a decade, the increased emphasis on schooling will lead to higher schooling levels for young adults. The obvious question is where these laborers will find work. The evidence presented here suggests that the nonagricultural economy is an important outlet for these workers, but it is unclear whether the opportunities will be available. If not, given the role location plays in income generation it is likely that these newly educated will move to urban centers or at least closer to these centers. Putting OPORTUNIDADES in place without complementary policies to promote rural income generation is unlikely to promote rural development and in fact may lead to increased out-migration, especially from more remote areas.

The analysis does not point specifically to clear areas of policy focus for improving the income of the rural poor. While the results suggest a vast majority of households are involved in agricultural wage employment, it also shows higher returns from nonagricultural wage activities. However, focusing just on these activities is only likely to be successful in certain regions, particular near urban centers, where they tend to be more common. It also may depend on what complementary assets are available to specific households. This suggests that anti-poverty policies designed to promote rural income-generation and complement the cash transfers provided by OPORTUNIDADES are more likely to be successful if designed for a particular region or location and if they are flexible in their sectoral emphasis. The Microregiones program, which is one component of the Contigo strategy that is specifically geared towards improving income generation, is the program that is most likely to be effective in this regard. Microregiones takes a territorial approach to rural development. As such, it incorporates an assortment of institutional actors including different levels of government and civil society and is open to

supporting a range of activities. By focusing broadly on regional development and obtaining local information through local participation, it is in the best position to identify areas for potential income growth and bottlenecks that limit paths out of poverty. The key is that it works in a manner by which it is able to coordinate the activities of these various actors and plethora of programs under the Contigo umbrella. Only through such coordination is government policy likely to be able to effectively support a set of activities that will allow the rural poor to progress out of poverty.

7. Conditionality and targeting

As noted in the conceptual discussion in section 3, conditionality can influence the targeting of programs by inducing self selection out of the program. To determine how conditions may influence dropping out of the program, Alvarez, Devoto and Winters (2007) have conducted an analysis of why households drop out of the OPORTUNIDADES program using the administrative data of OPORTUNIDADES (including the ENCASEH surveys). As with the analysis of survival in staples by PROCAMPO recipients presented earlier, dropouts from the OPORTUNIDADES program uses a discrete survival (or duration) model to analyze the factors that influence the risk of dropping out of the program at time *t*, given that the event did not occur before time *t*. The analysis focuses on the four cohorts that entered the program in 1998. Since households are provided with payments every two months, conditions are verified at that point in time, so beneficiaries are at risk of dropping out of the program every two months. Data is included from the second bimonthly period of 1998 (March-April) to the fourth bimonthly period of 2004 (August-September). This gives up to 39 discrete observation points in time for each beneficiary household. Factors expected to influence dropouts include both household and community level factors but also administrative factors such as the health care provider as well as changes in the administrative procedures. Results are presented in Table 16.

The results indicate that a number of beneficiary and household characteristics influence the odds of dropping out. Of particular interest is the puntaje variable which is a measure of household wealth (with higher values indicating lower wealth). A principal interest for OPORTUNIDADES is determining the relationship between wealth and dropping out with a concern being that the richest and poorest households may be most susceptible to dropping out of the program. To test this hypothesis, the puntaje variable is included in a nonlinear form. The results support the hypothesis that wealth matters (all three variables are significant) and indicate a nonlinear relationship between dropping out and the puntaje. In order to see this relationship more clearly, the first panel of Figure 4 graphs the puntaje against the predicted probability of dropping out based on the specification presented in Table 16. The graph indicates that the likelihood of leaving the program is highest at low levels of the puntaje (relatively wealthier recipients) and declines at a diminishing rate as the puntaje increases. The results support the hypothesis that conditionality is leading to self selection out of the program and is thus acting as a targeting mechanism. Note, however, that while there is a small increase in dropouts at the poorer end of the distribution, the level of dropouts is relatively small. Thus, it appears that concerns that conditionality may be pushing out the extreme poor are unsupported by evidence.
The upper right hand panel of Figure 4 provides a graphical representation of the hazard function presented in Table 16. The graph clearly shows a steady decline in dropouts over time and

mirrors those without controls. On average, there is an approximately 0.5 percent dropout rate for each period, or around 3 percent per year which leads to 20 percent of beneficiaries leaving the program over the period in question. The survival function is relatively flat, suggesting that households are at similar risk of dropping out no matter how long they stay in the program.

Table 16: Survival model of dropouts from OPORTUNIDADES

	Odds Ratio	z-stat
Characteristics of recipient		
Male recipient	1.14**	2.26
Age	0.90***	-25.17
Age squared	1.00***	22.11
Years of education	0.97***	-4.11
Indigenous	1.22***	2.36
Single	1.16***	3.50
Works outside home	1.18***	3.44
Household characteristics		
Dependency ratio	0.89***	-3.39
Number of people	0.95***	-3.84
Public assistance	0.83***	-2.34
Transfers from family member	1.15**	2.01
Puntaje	0.42***	-14.81
Puntaje squared	1.24***	6.79
Puntaje cubed	0.99***	-3.23
Community characteristics		
Index of marginality	0.98	-0.56
Healthcare provider		
IMSS Solidaridad	0.24***	-22.40
Administrative factors		
Operational guidelines in effect (1999.4 onward)	7.48***	18.18
Just-in-time monitoring system in effect (2000.4 onward)	4.07***	12.03
Implementation of guidelines (1999.4)	0.62***	-3.96
Distribution of identity cards (2003.3)	6.57***	18.03
Distribution of identity cards (2001.3)	2.66***	11.50
Problem with payment withdrawals (2002.6)	1.54***	3.78
No delivery of debit card or no *Bansafi* signature (2003.2)	2.24***	8.31
Correction of inclusion errors (2003.4-2003.6)	2.08***	10.34
Hazard function		
Time	0.53***	-18.35
Time squared	1.03***	15.20
Time cubed	1.00***	-12.48

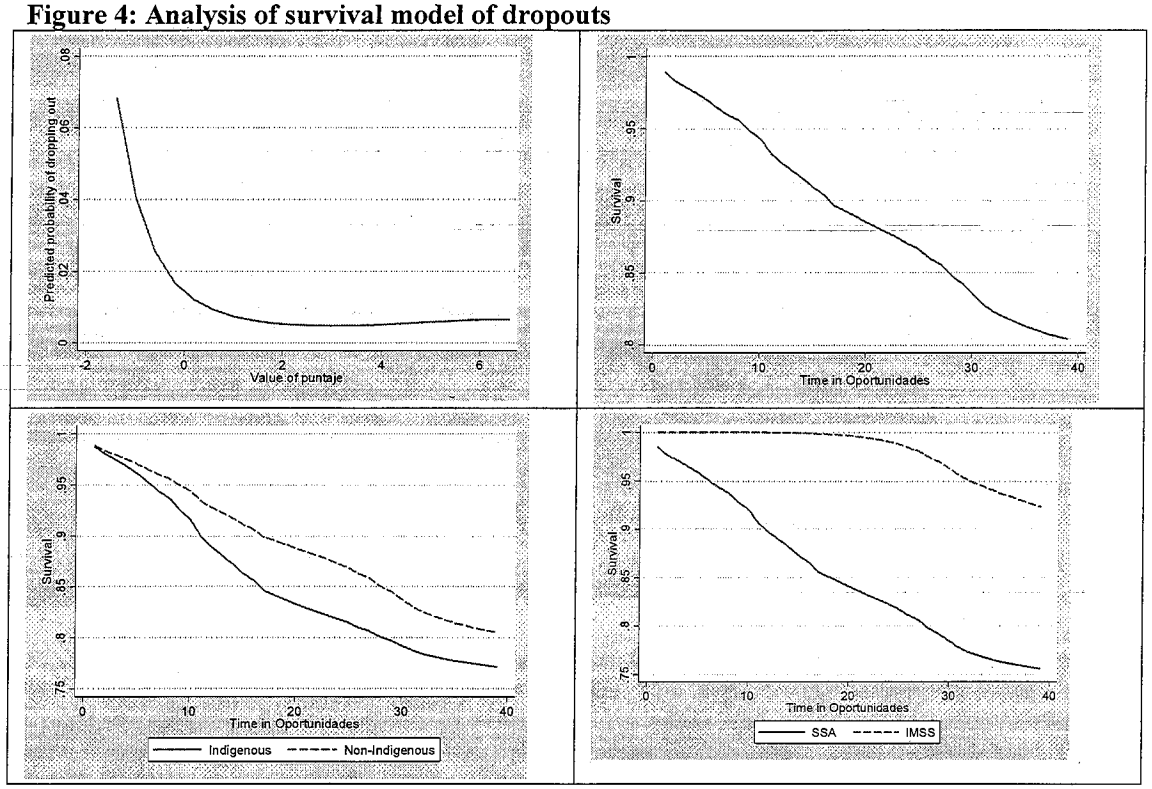
Source: Alvarez, Devoto and Winters (2007) Table 2

Notes: Results for state fixed effects and date of entry fixed effects are included in the regression but not presented in the results. *significant at 10%, **significant at 5% and ***significant at 1%.

The results in Table 16 indicate that being indigenous increases the odds of leaving the program. The indigenous population in Mexico is on average poorer than the Mexican population as a whole and has faced historical discrimination. In its initial stages, OPORTUNIDADES failed to provide adequate information in indigenous languages, which may have led to confusion over rules and failure to meet conditions. To examine whether the indigenous population is leaving

the program at a faster rate than the non-indigenous population, particularly in the initial stages of the program, an additional specification was run in which the hazard function was interacted with the indigenous dummy variable to test whether dropouts vary across time between the two populations. The results can be seen graphically in the bottom left panel of Figure 4. Indigenous people are leaving the program at a faster rate than the non-indigenous population. At the end of the period in question, 3-4 percent more indigenous people had dropped out compared to non-indigenous. There does not appear, however, to be a higher level of dropouts of indigenous at the initial stages of the program as was hypothesized. If anything, the rate of departure from the program by indigenous people increases around the tenth time period and continues at a higher rate until the twentieth period.

Figure 4: Analysis of survival model of dropouts



The results also point to a difference in dropouts across healthcare provider. Following a similar procedure for the indigenous variable, the relationship between the healthcare provider and survival was examined. The results shown in the bottom right panel of Figure 4 shows the difference in dropouts over time across the healthcare providers. The results are rather dramatic, with a much lower survival rate for SSA versus IMSS. Nearly 25 percent of SSA recipients are expected to dropout over the 39 periods versus less than 10 percent for IMSS. The results should be viewed with some caution since the healthcare variable may be capturing something else about the households that receive healthcare through each provider and additional health and community variables that could help control for other factors were not available for inclusion in

the regression. The results, however, are dramatic enough to strongly suggest examining in detail the reasons for this occurring.

Finally, in Table 16 a range of variables related to the administration of the program are included. In some cases, these administrative factors were designed to improve the monitoring of the program and in others they are administrative difficulties. In general, the expectation is that administrative factors will increase the odds of dropping out since the factors usually signal improvements in the monitoring of program conditions. With the exception of the initial introduction of operational guidelines in 1999, all of the other administrative factors increased the odds of dropping out. The negative impact of the introduction of guidelines compared to the large effect of the guidelines once in place suggests a lag in the effect of introducing the guidelines. In general, the significance and large magnitude of the results indicate that administration of programs has a substantial influence on whether recipients stay in the program. This is only problematic if these administrative changes result in increased inefficiencies. In some cases, it may mean that the administrative factors are increasing the self targeting of households by leading to better enforcement of conditions.

The policy implications of these finding argue for the inclusion of conditionality in program design in order to induce beneficiary families that may have erroneously been included or have changed their welfare status over time to self select out of the program. One must stress that this relationship should hold for a program in which conditionality is closely monitored and enforced such as the OPORTUNIDADES program. The finding that indigenous households in general appear to have a higher probability of dropping out should be carefully reviewed by program operators. In the last few years, OPORTUNIDADES has been actively engaged in establishing re-entry mechanisms for these sorts of cases. Much of the fieldwork during the past two years in rural areas has been concentrated in resurveying communities and incorporating families that may have dropped out but are still highly vulnerable. A related policy conclusion is that administrative shocks, or changes in certain operational processes, have an enormous impact on the probability of families being taken off the roster and thus losing eligibility. The magnitude of these shocks can be equivalent to a covariate shock such as a drought or flood, and thus we conclude that even though the program has generated higher degrees of protection against various shocks that families faced, it has generated some of them itself because of operational mishaps. In recent years, the program has dramatically reduced these types of shocks by implementing decentralized monitoring systems to prevent these occurrences. However, the cyclicality of misreporting on health conditionality, particularly for those families relying on SSA healthcare services, is of great concern.

8. Lessons learned from the analysis and other programs

OPORTUNIDADES and PROCAMPO both provide cash transfers to rural households, including in many cases to the same households, yet the two programs differ in terms of objectives, targeting, eligibility criteria, conditionality and administration. Given these program differences, this paper has examined a range of outcomes—particularly those related to productive activities—in order to determine if the programs have different impacts and if so, what is behind these differences. In this section, we summarize these lessons in order to provide support for our recommendations regarding a new PROCAMPO program.

Along with summarizing the lessons from the analysis presented in the previous sections, we also consider the lessons that can be gained from related programs in other countries. In particular two sets of the programs are considered. First are CCT programs that have been implemented in other countries. Based on the perceived success of OPORTUNIDADES, CCT programs have been replicated in a number of countries in Latin America and elsewhere. Evaluations of these other CCT programs largely confirm that this approach can have positive impacts if properly designed and administered. A second set of programs are agricultural programs that provide income transfers to farmers. These transfer programs, like PROCAMPO, are generally implemented as part of policy reforms that move away from agricultural protection and subsidies, which distort markets and lead to overproduction, towards direct payments to farmers that are "decoupled" from production. These programs have been widely used particularly in the United States and Europe, but also in other countries such as Turkey, and offer relevant insights into understanding farmer spending, investment and diversification.

Overall recipient welfare and poverty alleviation

Both PROCAMPO and OPORTUNIDADES seem to have improved the welfare of recipient households in terms of consumption, income, dietary diversity and caloric intake, though it is difficult to compare the relative impacts. Moreover, OPORTUNIDADES also has had an impact on human capital investment in terms of school enrolment and a variety of health outcomes. PROCAMPO does not appear to have had an impact on these outcomes, and in fact, participating in PROCAMPO, or owning land, is associated with a lower incidence of health checkups. These differences in program impact may derive from the conditionality associated with OPORTUNIDADES and/or the fact that the PROCAMPO transfer amounts were too small to induce impact via an income effect. The negative PROCAMPO impact on health checkups is attributed to the higher shadow value of household labor in agricultural households.

With respect to welfare and human capital outcomes, the results of impact evaluations of other CCT programs in Latin America are similar to those described for OPORTUNIDADES.[12] For example, evaluation results from PRAF II in Honduras, RPS in Nicaragua, Familias en Acción in Colombia, Bolsa Alimentação in Brazil, and OPORTUNIDADES all have shown a large and significant boost in food purchases, dietary diversity and/or caloric availability.[13] Similarly, participation in RPS, Familias en Acción, Bolsa Familia in Brazil, and OPORTUNIDADES have

[12] See reviews in Rawlings and Rubio (2005) and Handa and Davis (2006)

[13] See Hoddinott and Skoufias (2004) for OPORTUNIDADES; Maluccio and Flores (2005) for RPS; Attanasio and Mesnard (2005) and Attanasio et al (2005) for Colombia; and Ministério da Saúde (2004) for Bolsa Alimentação.

been associated with a reduction in stunting among children in beneficiary families,[14] while PRAF II, RPS and OPORTUNIDADES have shown positive impacts on utilization of health services.[15] CCTs have also played an important role in protecting those vulnerable to food insecurity in the face of an uninsured shock; Maluccio (2005) shows that RPS helped beneficiaries cope with the coffee crisis in Nicaragua, while de Janvry et al. (2006) find that OPORTUNIDADES protected children from being taken out of school in the event of a shock. Finally, in their review of social spending in Latin America and the Caribbean, Lindert, Skoufias and Shapiro (2006) find that CCTs are well targeted and have an important role in redistributing income in the region. CCT programs are generally found to be welfare improving.

Like PROCAMPO, decoupled transfer payments to farmers in other countries have generally been designed to compensate farmers for losses in welfare due to the removal of market distorting agricultural protection and subsidies. As such, they seek to improve the welfare of recipients relative to what welfare levels would be without protection and subsidies. The 1985 US Farm Bill was one of the first successful attempts to decouple farmer payments from production by using historic rather than current production to determine payment levels. The 1996 Farm Bill further based payments on historic entitlements and allowed greater flexibility to farmers in planting decisions. The EU has followed similar principles basing some payments on historic rather than current production. The EU has also included minimum area set asides to reduce overall production and additional voluntary set-asides (Baffes and De Gorter, 2005). The use of historic payments to determine transfers is a mechanism to maintain approximate welfare levels that are similar to previous levels that were achieved under the distorting policies. Thus, assuming that they are designed and administered properly, these types of programs improve welfare relative to the counterfactual of removing market distorting agricultural policies. It is this fact that has made them politically feasible.

Not all decoupled transfers implemented along with a general policy reform have led to overall welfare improvements. Turkey's Direct Income Support (DIS) Program which was implemented in 2001 was designed to only partially overcome the welfare impact of a general reduction of agricultural subsidies. Approximately 75 percent of Turkey's farmers received the program and, like PROCAMPO, US and EU transfer programs, eligibility for the DIS program was based on historic production; although less on particular sets of crops since most farmers were eligible. Analysis of the DIS program indicates that like PROCAMPO the program had significant multiplier effects (2.5 for DIS versus 2.1 for PROCAMPO). This multiplier is attributed to the fact that DIS allows households overcome credit constraints. However, even with the multiplier effect, the analysis indicates that the average agricultural income of program recipients fell by 16 percent as a result of the removal of subsidies with only half of that (8 percent) covered by DIS payments thus leading to an overall welfare decline as a result of the reform package. (Lundell et al, 2004). The overall welfare effects of a transfer program clearly depend on the amount provided and how the transfer income is used.

[14] Note also that mistakes in design can lead to perverse incentives, such as occurred at one point with Bolsa Alimentação, when program eligibility requirements may have induced mothers' to keep their infants underweight (Morris, et al, 2004).

[15] See Morris et al (2004b) for PRAF II; Maluccio and Flores (2005) for RPS; Barham (2005), Gertler and Boyce (2001) and Barham (2006) for PROGRESA/OPORTUNIDADES.

Transfer programs improve the recipient welfare in multiple ways and quite often beyond the value of the income received. The manner in which they increase welfare appears to depend on who receives them (eligibility) and the conditions placed on the receipt (which is discussed more fully below). Through improving welfare, transfers can have an overall impact on poverty. For OPORTUNIDADES and other CCT programs, the primary mechanism for alleviating poverty is avoiding the intergenerational transmission of poverty. Investment in the human capital of the children of poor rural households is found to almost certainly induce a shift over time toward employment in the rural nonfarm economy and away from agriculture. However, the further a given individual lives from a city, the less impact education has on the probability of obtaining nonagricultural wage employment, thus necessitating migration. Similarly, the more isolated the household, the more likely a household will remain in low-return agricultural wage labor, regardless of the level of education of household members. For the subset of PROCAMPO recipients who are poor, the primary mechanism for alleviating poverty is through using transfers to overcome cash constraints and increase agricultural spending and investment. This allows for greater possible returns to existing production, which can provide greater income, but is unlikely to lead to dramatic increases in well-being unless accompanied by greater agricultural investment, improvements in productivity, or shifts to higher-value activities. The impact of the programs on agricultural outcomes is thus important in designing a new program and is considered in detail below.

Impact on agricultural spending, investment and diversification

In terms of agricultural and other productive activities, both PROCAMPO and OPORTUNIDADES seem to have induced investment in productive activities by providing liquidity to rural households. The impact on agricultural spending appears to be greater for PROCAMPO, which is not surprising since it is linked to land ownership and agricultural production. OPORTUNIDADES seems to have a relatively greater impact on inducing entry into new agricultural and nonagricultural self-employment activities as opposed to increasing the intensity of ongoing activities. The results clearly indicate that household characteristics matter, as can be also seen with different results found across land ownership categories for OPORTUNIDADES recipients and across household characteristics such as access to irrigated land, technical assistance and credit for PROCAMPO recipients.

The different results for PROCAMPO on agricultural outcomes could be driven by the fact these households differ or the fact that PROCAMPO transfers are not completely decoupled. In general, there has been significant debate about how decoupled agricultural transfer payments truly are and correspondingly how much they influence production. Decoupled payments may improve liquidity to farmers that are credit constrained and may provide income that increases wealth and lowers risk aversion thereby influencing production. For the United States, Goodwin and Mishra (2005) present evidence that indicates decoupled transfer payments influence acreage choices although the magnitude of the effect is small. They also note that farmers report using payments to purchase inputs, particularly those farmers that are highly leveraged suggesting transfers are used to overcome liquidity constraints. Similarly, Key, Lubowski and Roberts (2005) find that participants in US government transfer programs increase the production of program crops significantly more (between 38-59 percent) than nonparticipants with similar

characteristics.[16] It is not clear what motivates the program farmers to maintain production in program crops since the programs are decoupled from current production, but it may possibly be the desire to remain in future agricultural programs (Sumner, 2005).

Since decoupled payments tend to be based on previous acreage in production rather than output, this may create an incentive for farmers to substitute land for other inputs thereby influencing production decisions. Sckokai and Anton (2005) argue that the expected impact of focusing payment on historic land area in a target crop would be an increase in acreage under production and a reduction in yields with the total effect on output depending on the relative magnitude of these two factors. They test these hypotheses using data on a range of agricultural programs with varying degrees of decoupling in the EU. The results of their analysis confirms that in the majority of cases payments focusing on historic acreage induce a larger area response, a negative yield response and a smaller total output response relative to programs not based on land area. Overall, the results suggest that even seemingly decoupled payments in developed countries have some influence on agricultural production.

The impact of the Turkish DIS program on agricultural production—which is the most similar to PROCAMPO in terms of its design and context—is unclear because, like PROCAMPO, it was implemented in conjunction with a general agricultural reform program and separating DIS program effects is difficult. The overall reform did appear to lead to a reduction in production of the most subsidized crops (tobacco and sugar beet) and an expansion of deregulated crops (cotton). Analysis of household data collected in 2002 (just over a year after the program initiated) indicates that the area sown to grains fell while area under fruits, vegetables and sunflower production increased which corresponds to the changes in relative prices induced by the policy reform (Lundell et al, 2004). Yet, the absolute magnitude of changes are small—2 percent decline in area for wheat from a base of 45 percent, 1.2 percent increase in fruits and vegetables from a base of 16 percent of area and 2.4 percent increase in sunflower production area from a base of 2.5 percent—and it may be that the initial year would not reflect long term trends. Thus, it is difficult to determine how DIS and the associated policy changes will influence agricultural production beyond this study period.

This issue of diversification of production can be critical in determining the impact of transfer programs. This is partly because the implemented policy changes are expected to induce changes in productive patterns. Additionally, the expectation for countries in the process of development such as Mexico (and Turkey) is that the number of farmers, and in particular staple producers, will decline over time with development. While PROCAMPO does appear to have induced agricultural spending, it does not seem to have significantly motivated farmers—particularly those without access to irrigation and further from the US border—to transition away from producing maize and other staple goods. The results of the analysis presented above do seem to indicate that both Mexican programs induced a degree of crop diversification, but there appears to be little substantial shift in farming systems and more of an increase in production for home use. The lack of shifting away from staples corresponds to the Key, Lubowski and Roberts'

[16] As the authors note, since participants self-select into the program, participants and nonparticipants may differ in fundamental characteristics. While it is possible to control for observable differences between the treatment and control groups, it is not possible to control for unobservable differences between program and control farms and thus these estimates may be biased.

(2005) finding (noted above) that US transfer recipients tend to be more likely to stay in program crops.

Similarly, a study of Irish farmers simulated optimal post decoupling production and compared this with farmers' production intentions. The study found a large portion of farmers intend on maintaining production practices even after payments were decoupled from current production (Breen, Hennessy and Thorne, 2005). The reason for farmers maintaining production is not completely clear. The authors of the Irish study argue that farmers may not view the payment as decoupled since, like PROCAMPO, it is linked to the primary factor of production, land. Irish farmers also indicate that they are concerned about programs continuing and thus adopt a 'safety first' approach of not changing practices in case the program is altered and they find themselves back to where they were prior to the program.

PROCAMPO recipients maintaining production practices could be motivated by similar views, including concerns of the longevity of projects or the desire to stay in PROCAMPO to obtain future program benefits. Even if the program is decoupled from present production the perception may be that continuing to produce program crops is the mostly like way to ensure coverage. Furthermore, given the lack of complementary policies and the existence of targeted price subsidies which have provided incentives for remaining in maize, it is not too surprising that PROCAMPO recipients did not shift out of staple production. There may have been limited incentives and few opportunities. In and of themselves, transfers—even when apparently decoupled—may induce some spending and investment but may be insufficient to induce dramatic changes in farm production.

Conditionality and eligibility

The discussion of overall impact and the impact on agricultural outcomes provides some indication of the role that conditionality and eligibility play in these outcomes. Here, we build on that discussion and present additional evidence of the role that these two design components. Note that CCT programs have intentionally been designed to include conditions that shift incentives to promote human capital investment. On the other hand, farmer income support programs have generally been designed to be decoupled from production in order to limit incentives to produce in a certain manner. Thus, the two types of programs differ fundamentally in this regard.

For CCT programs, it is not completely clear what role conditionality has played in achieving the positive outcomes noted above. Unfortunately, serious empirical analysis disentangling the income and substitution (or price) effects have yet to be undertaken within the context of CCT evaluations for any of the education, health, or nutrition components due to data limitations. One study by Hoddinott and Skoufias (2004) finds that OPORTUNIDADES' impact on food consumption goes beyond a simple income effect and also includes what they call a '*platica*' effect—behavioral change induced by participation in health and nutrition talks. On the other hand, there is evidence that conditionality may not always be necessary to induce some level of a desired behavioral response. Unconditional cash transfers given to a woman, for example, may lead to a greater impact on welfare and health than a gender-blind unconditional transfer, for the

same reason that CCT programs prioritize women as beneficiaries.[17] In the case of *Bono de Desarollo Humano* in Ecuador, despite nonenforcement of conditionality, participation in the program had a positive effect on child development (Paxson and Schady, 2007). It is not known, however, whether the Ecuador CCT program would have had the same impact if households had known that the conditions would not be enforced. Furthermore, in both this case and a hypothetical case of an unconditional transfer given to women, it is unclear whether the impact from these programs would have been even greater with conditionality.

For traditional agricultural support programs, the fact that payments are based on current production creates a condition that is generally viewed as resulting in a clear behavioral response in terms of increased farmer production. The push toward having decoupled agricultural payments has been motivated by the desire to avoid a behavioral response by farmers that leads to market distortions. In practice, agricultural payment schemes, PROCAMPO included, are rarely completely decoupled or unconditional on farmer behavior. They are typically conditional on maintaining land in production or in good agronomic condition, and/or compliance with environmental, food safety, and/or animal welfare standards (Swinbank, 2004). As the above discussion notes, there is some evidence that these apparently decoupled programs create their own set of incentives although they tend to be less distorting that traditional agricultural support programs.

The experience of PROCAMPO and OPORTUNIDADES and the differences in the impacts of the programs as well as the analysis of related programs suggest that conditionality works as a mechanism to induce a behavioral response and that characteristics of recipients influence the significance and magnitude of outcomes—that is, conditionality and eligibility criteria matter. Furthermore, in the case of OPORTUNIDADES conditionality acts as a mechanism to induce better-off recipients to self select out of the program by creating a cost to program participation. A similar self targeting has been found in other programs such as Argentina's *Trabajar* program (Jalan and Ravallion, 2003; Galasso and Ravallion, 2003). Conditionality can play an important role in program targeting and given the OPORTUNIDADES experience, it is evident that while it comes with a cost, conditionality is administratively feasible in Mexico.

9. Policy recommendations

OPORTUNIDADES offers a clear and proven direction for poverty alleviation by providing education to the children of poor rural households, which will allow them to exit agriculture via the local/regional nonfarm economy or migration. As such, it remains a critical component of rural poverty alleviation in Mexico. To enhance the returns to OPORTUNIDADES, however, it is clearly necessary to take measures to stimulate rural nonfarm employment generation to ensure there are opportunities for the newly educated. Without such complementary actions on the productive side of the economy, OPORTUNIDADES is likely to simply induce migration to urban centers or abroad and the economy will fail to absorb the newly educated created by the

[17] Argueo, Carter and Woolard (2006) find that the unconditional Child Support Grant in South Africa, which is given to the mother, leads to significantly greater children's height. Similarly, Duflo (2003) found that old age pensions in South Africa given to grandmothers had disproportionately benefited girls under their care.

OPORTUNIDADES program. The long-run social returns to the program will be greatly enhanced by such complementary actions.

Agriculture still currently plays an important role for certain groups of poor rural households, however. Adults have a harder time transitioning to the nonagricultural economy, since they often lack education and are not receiving any additional education or training.[18] The OPORTUNIDADES program does not address the current productive side of the rural household economy, and given the heavy demands on adult time via conditionality, creates conflicts with the availability of agricultural labor on the home farm. Not only do social programs not cover this population, but agricultural programs, with the notable exception of PROCAMPO, generally concentrate support on better-off farmers. This failure to recognize the needs of the current generation of the adult poor exposes a clear gap in Mexico's rural development policy. We believe that providing a mechanism for smallholders to improve their livelihoods is an important component of an overall rural development strategy and that a new PROCAMPO program can fill this gap in Mexican policy.

Moreover, smallholder agriculture has an importance that goes beyond its small share in total rural income. First, smallholder agriculture is responsible for the stewardship of a large share of the natural resource base and agricultural biodiversity of Mexico.[19] Second, households may value home production beyond its share in income, whether from its role in traditional indigenous cultural practices, as a way of maintaining social or cultural ties with the home community in the face of massive migration, or simply as a culinary preference. Third, small farmer agriculture plays an insurance function as an economic activity and source of food security of last resort, in the context of missing rural insurance markets and limited access to social security and old age pensions. Fourth, the existence of vibrant smallholder agriculture is a public good for a number of reasons, including maintaining a nation's link with its agrarian past, playing a role in tourism, and serving as an economic anchor by which to maintain some portion of the population in rural areas, but not in conditions of poverty. Along with the need to address current poverty through productive activity, these factors support the argument for maintaining a PROCAMPO program.

We propose an alternative PROCAMPO that would complement the long-term poverty reduction strategy of OPORTUNIDADES by providing cash with productive and natural resource management options for smallholders. This addresses the productive and social needs of Mexican smallholders and will help to meet the broader objectives of the Contigo strategy, particularly in the area of providing opportunities for income generation. The role of the envisioned program is akin to the National Program for Family Agriculture (PRONAF) which is part of the Brazilian Zero Hunger Program (Fome Zero). Like the Mexican Contigo strategy, Fome Zero represents a broader attempt to address poverty in Brazil and incorporates various components, including the CCT program Bolsa Familia (FAO, 2006). PRONAF complements Bolsa Familia through support of smallholder agriculture by providing credit for productive investment. Although PRONAF is not a cash transfer program, conceptually it follows the same

[18] OPORTUNIDADES now includes an old age pension which provides transfers to the elderly but sill does not provide productive support for working adults.
[19] Mexico is a center of origin and diversity for maize varieties, much of which is maintained on smallholder farms.

logic as the program proposed here in terms of highlighting the need for facilitating productive opportunities for the poor.

The proposal is presented in two parts. First, some fundamental characteristics of a new program are highlighted in order to provide an overall view of how we envision the program. Second, a more concrete proposal is provided. The difficulty in providing such a proposal is that we do not have a clear idea of the potential political and budgetary parameters and constraints facing the new program. This proposal is thus meant only to serve as an input into the policy discussion; as such we indicate in a number of instances where alternative program design choices are available.

We begin with the fundamental characteristics of a new PROCAMPO program. In offering these suggestions, we consider the lessons learned and highlighted above; namely the important role of targeting, eligibility, conditionality, and administration on program outcomes. A new program should consider the following:

- *Target poor smallholders*. The bulk of the new program should be targeted to poor smallholders, or those with 5 hectares.[20] The definition of smallholder would be linked to the amount of land in past agricultural production. To avoid creating production incentives linked to specific crops, the program should consider targeting all agricultural production, not just staples. One component of the program would also be available for producers with up to 10 hectares of land. Agricultural producers with land sizes greater then the maximum limit of eligibility would be assisted by other SAGARPA initiatives more specifically geared toward their needs.

- *Alternative modalities for eligibility.* General eligibility would depend on the targeting criteria noted above. But a PROCAMPO program could also create modalities that would be linked to specific objectives. This would be similar to the way OPORTUNIDADES has modalities for education and health. Eligibility for a natural resource component, for example, could depend on a designation of regions/agricultural practices/crops as being in need of special natural resource and agricultural biodiversity management.

- *Differentiated instruments for indigenous communities*: Households making up indigenous communities may employ a different logic in terms of economic production, community management of economic activities and social relations in general. For those communities operating under more collective modes of economic and social interaction, differentiated instruments, including conditionality and payment mechanisms, will be utilized.

- *Conditionality*: The transfer would have two components. One component would be a fixed amount (unrelated to land area) and unconditional. This component would target all agricultural households with less then 5 hectares, including asset poor and liquidity constrained households (those eligible for OPORTUNIDADES) as well as liquidity constrained family farms (not eligible for OPORTUNIDADES). Transfers alone,

[20] The 5 hectare cut-off has been chosen as a possible definition of smallholders. Careful consideration should be given to defining this and other cut-off points.

however, even if large, are likely to be insufficient to lead to substantial changes in agricultural production systems that enhance income and improve natural resource management. These changes are likely to require some form of technical assistance that could be coupled with the receipt of transfers with the objective of improving productivity. Thus the second component would be based on per hectare amount and conditional on mandatory participation in capacity building and/or the adoption of certain agricultural practices or resource management. Conditionality would also be useful in screening out those people who should not be targets of the program or are unlikely to benefit from such an approach. A tradeoff would be faced with the cost and logistics of monitoring conditionality.

- *Sufficient and timely transfer amounts*: Transfer amounts need to be sufficiently large to induce desired investment, shifting to higher-value activities, or to specific natural resource-management practices. Part of the success of OPORTUNIDADES is clearly due to the fact that the quantities provided were sufficiently large to induce responses. The timing of payments should also be considered. On time, regular payments are more likely to relax general credit constraints and seasonal liquidity constraints.

- *Administration and coordination*: Although the proposed program includes a social objective, given its agricultural and natural resource management content and its focus on improving productivity and shifting production to higher-value productive options, such a program should remain in SAGARPA and not be passed to OPORTUNIDADES, SEDESOL, or SEMARNAT. However, such a program would require careful coordination with public programs operating in rural areas in order to maximize synergies and operational efficiency and to minimize conflicting incentives and rules of operation. This includes Alianza Contigo and other SAGARPA programs as well as OPORTUNIDADES and other SEDESOL programs in rural areas. A natural resource component would also need to be coordinated or integrated with proposals to establish payments for environmental services. One important step would be the integration of the Padron Social database with a similar database of beneficiaries of SAGARPA programs.

- *Piloting, monitoring and evaluation*: A new scheme should be piloted before national take-up and should explore alternative forms of eligibility modes and transfer options. Random allocation of alternative forms of the program could allow for careful analysis of what is most effective in alleviating poverty and promoting productivity gains in smallholder agriculture. In general, the new PROCAMPO should follow the example of OPORTUNIDADES in terms of rigorous and continuous monitoring and evaluation and careful management of information systems. Only through such careful monitoring and evaluations systems can clear lessons be learned.

With these fundamental characteristics in mind, we move to a more concrete proposal. In designing this proposal, we assume that from a political standpoint some form of new PROCAMPO-type program must be implemented and that program must cover at least a significant share of farmers currently covered by PROCAMPO to ensure political support. This means covering those who may not be considered poor by conventional indicators of poverty, but who are relatively worse off among rural producers. The general objective of the program

would be to improve the well-being of poor family farmers through providing liquidity for agricultural spending and expanding agricultural productivity of these farms.

Targeting and eligibility

Given the objective noted above, the program should target relatively poor smallholders. Since land is the key asset for agricultural production, it is logical to use land area to define those that are relatively poor. Nearly 90 percent of PROCAMPO recipients have less than 5 hectares of land and they only receive approximately 40 percent of total PROCAMPO payments. These farmers, particularly those with less than one hectare of land, are likely to be the most credit constrained and are likely to benefit most from transfers. These households form the core of the project. Politically, however, it may be necessary to include those with more than 5 hectares to ensure support. If this is the case, these larger farmers could be included but it is hard to justify providing transfers for them to reduce liquidity constraints, and therefore they should only qualify for the conditional component of the transfer.

- Definition of smallholders: we propose a maximum of 5 hectares per household, with eligible land defined as the average total land production over the previous three agricultural seasons. Households with between 5 and 10 hectares of land could participate in the conditional part of the program.
- This eligibility criterion equates the size of landholdings with welfare, assuming that landowners with less then 5 hectares in production are relatively poor. An alternative would be to combine land size limits with a more traditional SEDESOL/OPORTUNIDADES definition of poverty. On the positive side, equating landholdings with poverty simplifies targeting into one variable and avoids overlap with social programs such as OPORTUNIDADES. This facilitates program implementation and will provide farmers with a better understanding of program rules. It is also likely to increase political support among farmers. On the negative side, such an assumption could lead to inclusion of a significant number of recipients who are not considered poor by conventional measures. This is particularly true if the past production of non staple crops is permitted for inclusion. The simplicity-leakage tradeoff would need to be evaluated.
- As with the current PROCAMPO program, OPORTUNIDADES recipients should be considered eligible for the program if they meet the eligibility criteria. A cap on total payment from the two programs might be considered if there are concerns regarding the total amount of public support provided to a given household.
- Largeholders (greater than 10 hectares) would be reached by other SAGARPA initiatives more specifically geared toward their needs and not included in the program.
- The new program should employ geographic targeting to roll out the program in areas of high density of the target population of poor smallholders. This would be similar to the marginality-based geographic targeting employed in the early years of OPORTUNIDADES, but could be based on the distribution of landholdings in combination with community-level marginality.
- Payment should be provided to the owners of the land, not renters. Evidence from the PROCAMPO experience (as well as from similar programs in other countries) suggests that payments (even to renters) were reflected in rental price and thus ultimately accrued to owners.

- There are two components to the transfers. All poor households would receive a fixed unconditional transfer, unrelated to household landholdings, while both smallholders (<5 hectares) and medium landholders (5-10 hectares) could opt to participate in the additional, conditional component of the transfer.
- Only one beneficiary per household will be allowed, and the household member receiving the transfer would be defined by the household itself and is expected to be the individual most involved in the management of agricultural production.
- Eligibility should be guaranteed for six years when the program and roster will be updated.

The proposal can be summarized as follows:

Group	**Definition**	**Unconditional base transfer**	**Conditional transfer**
Group 1: Liquidity constrained family farms	Less than 5 hectares historically in production	Yes	Up to 5 hectares, with conditionality
Group 2: Asset poor and liquidity constrained farmers	OPORTUNIDADES recipients meeting program eligibility criteria	Yes, but may want to consider cap on total amount that may be received from both programs	Up to 10 hectares, with conditionality
Group 3: Medium family farms in need of natural resource management assistance	5-10 hectares of land under production	No	Up to 10 hectares, with conditionality

Additional considerations in terms of targeting and eligibility:

- The program should consider moving beyond just staple producers to a broader range of producers given the tendency to maintain production of program crops and the desire of the program to decouple transfers from current production. The focus on agriculture in the program will necessarily lead to an emphasis on agriculture as a pathway out of poverty. Thus, when calculating total land in production over the past three years, all types of production could be considered. One potential pitfall of including all production is that smallholder farmers producing non staple crops probably have a higher probability of not being poor. Another problem would be increased cost of the program. This may be compensated by exclusion of all households with greater then 10 hectares from any participation in the program or by making crop-specific area cut-offs for participation.
- These and other trade-offs are summarized in the following table:

Crop category	Targeting efficiency	Level of decoupling	Cost
Staple producers	- More likely to include poor farmers thus minimizing errors of inclusion - Likely to exclude a significant number of poor non staple-producing farmers, thus increasing the errors of exclusion	- Less decoupled: Farmers more likely to keep producing staples to ensure continued perceived eligibility in the program, limiting changes to high value crops	Less costly since it limits the definition of who is eligible
Staple plus food producers	- More errors of inclusion - Fewer errors of exclusion	- More decoupled	Cost would be higher than including just staple producers
All crops	- Most errors of inclusion since producers of high-value crops with limited land may be included - Fewest errors of exclusion since includes all smallholders	- Most decoupled: Farmers free to produce any crop since all are in the program	Cost would be greatest since including all farmers

Unconditional transfer component

The motivation of the unconditional transfer is to assist poor smallholders in overcoming liquidity constraints. While those with more land may have greater cash requirements for production those with less land are more likely to be severely constrained. Given this trade-off and a desire for the program to be progressive, we recommend the transfer be a lump size regardless of land size. Specifically, we recommend the following:

- Eligible households should be provided with a base transfer similar in value to current PROCAMPO payments which (for poorer households) are worth approximately 7-8 percent of average recipient household expenditure. The transfer should be unconditional and available to all household deemed eligible based on the criteria noted above. This unconditional transfer should be the same regardless of total eligible land area. The objective of this transfer is to provide basic liquidity to smallholders to help facilitate productive investment.
- Depending on the total amount of the base transfer, for those who also receive OPORTUNIDADES transfers, the program may want to limit the total amount that may be received by a given household from both programs.

Conditional transfer component

The conditional transfer component seeks to induce a behavioral response in recipients; namely, to improve the productivity of agricultural production and/or improving management of the natural resource base in order to increase agricultural income. This is desirable for those in the base category (< 5 hectares of land), but also for the poor as defined by OPORTUNIDADES

recipients who own land. Furthermore, it may be desirable to induce those with more than 5 hectares to invest in natural resource conservation. The conditional transfer component is independent of the unconditional component, and eligible households may opt to participate without jeopardizing receipt of the unconditional transfer. The conditions on program participation can then work as a self-targeting mechanism in which those most motivated and/or most likely to gain participating in the program. Based on these considerations, we recommend the following:

- A conditional transfer component linked to agricultural production or natural resource management training and implementation of new management practices will be included in the program. Technical assistance via conditionality could focus on a variety of topics including improving productivity of staple crops, facilitating the shift of production from staples to higher value crops, improving the quality of post harvest processes or increasing market participation. Natural resource management should facilitate the sustainable management of agricultural lands and the preservation of agricultural biodiversity. Programs should be region specific and determined by regional SAGARPA offices.
- Eligibility for this component would be open to all those deemed eligible for the base transfer as well OPORTUNIDADES households that have productive land and are thus defined as eligible. Households with more than 5 hectares of land and not defined eligible for the base transfer should be eligible for transfers with a natural resource management component. Recipients would self select into this component.
- The transfer would be conditional on adopting certain agricultural practices or attending public lectures on productive activities and natural resource management and from these lectures presenting a management plan for improving on farm production practices. Failure to adopt given practices or to attend lectures, present management plans and carry out these plans would result in being dropped from this component. A careful monitoring system similar to that developed for OPORTUNIDADES would need to be implemented.
- This part of the program would need to be carefully integrated with the activities or Alianza Contigo in the same manner in which OPORTUNIDADES works with the secretaries of education and health.
- In order to create proper incentives, payment amount could be on a per hectare basis, with total payments greater to those with larger land area. Alternatively, per hectare payments could diminish with land size. The amount of the conditional transfer should be based on the amount of land deemed eligible at the initiation of the program. Those with less than 1 hectare of eligible land should receive the same amount as 1 hectare.

Transfer administration

The transfers are partially to improve liquidity and as such should be made on a regular basis. They also may play a role in increasing the number of smallholders linked to the formal financial sector. This has been done with CCT programs in other countries and appears to be successful. As such we recommend the following:

- Transfer payments should be made on a regular basis, such as quarterly, to facilitate its use for overcoming liquidity constraints.

- Transfers should be directly deposited into savings accounts and accessible via debit cards. This will facilitate the entry of smallholders into the formal banking system. Alternatively, the OPORTUNIDADES payment system could be adopted.

Piloting and evaluation

The initial random allocation of OPORTUNIDADES to treatment and control groups allowed for detailed evaluations of the program that not only provided clear evidence of the success of the program but helped to improve program design. A new PROCAMPO program should be done in a similar manner and we therefore recommend the following:

- The program should undergo a one year pilot in order to ensure that it meets the overall objectives of the program and that the specific conditions achieve the objective of improving agricultural production. Doing this requires randomly allocating communities as beneficiaries (treatment) and non-beneficiaries (control), as was done in the early years of OPORTUNIDADES. This will allow program administrators to identify the impact of the program. The control group would receive the program at one year after the treatment group.
- Ideally, different types of program components would also be piloted and randomly assigned to different communities. This would also allow the careful evaluation of alternative program components.
- If it is not feasible to carry out a randomized experiment, alternative quasi-experimental methods should be considered.

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