Do Cash Transfers to Farmers Reduce Migration? Procampo in Mexico

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Abstract

This paper provides a theoretical model to suggest that if cash transfers for farmers have or are perceived to have conditionalities in terms of location (whereby at least some household members must remain at the place of origin to benefit from the transfers), their impact on temporary and permanent migration is uncertain a priori. To test empirically what the impact of the transfers could be, we use data on Procampo, a large transfer program for rural farmers in Mexico implemented since 1994. We find that the impact of Procampo on both permanent and temporary migration has been negative.

Resumen

Desarrollamos un modelo teórico que sugiere que si los agricultores reciben transferencias en efectivo sujetas a la permanencia de alguno de los miembros de la familia en términos de locación, el efecto que tienen estas transferencias en la migración temporal y permanente es ambiguo a priori. Para hacer una comprobación empírica del efecto de este tipo de transferencias, usamos datos de Procampo, que es un programa a gran escala de transferencias a agricultores que el gobierno en México implementó en 1994. Encontramos que el efecto de Procampo en la migración tanto temporal como permanente ha sido negativo.

JEL categories: O15, Q18, J61

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1. Introduction

When Mexico liberalized its economy and became part of NAFTA, concerns were raised about the impact of these policies on migration. With rural farmers suffering from the termination of traditional Government support programs and a sharp decline in domestic prices for some traditional crops, migration from rural to urban areas and from Mexico to the U.S. was expected to surge (e.g., Levy and van Wijnbergen, 1994 and 1995). To help the rural poor adapt to the liberalization mandated by NAFTA, Mexico's Government implemented Procampo, the Program of Direct Payments to the Countryside. Agricultural producers receive a fixed payment per hectare previously devoted to nine crops (maize, beans, wheat, cotton, soybeans, sorghum, rice, barley, safflower and barley). The program is one of the largest run by the Government, but it is transitional and will be terminated in 2008 (for a description and an analysis of Procampo, see among others Davis, 2001; Sadoulet *et al*, 2001; and Cord and Wodon, 2001).

In this paper, we develop a simple theoretical model to suggest that the impact of Procampo on migration is uncertain a priori. The basic idea is that the Procampo transfers increase the value of staying at home, but they may also increase the value of migrating, or at least facilitate migration. For example, among families with low incomes who have no access to credit markets, the transfer can be used to pay for the migration costs. The net impact of the various ways in which the transfer may affect migration is unknown a priori.

The impact of Procampo on migration is then tested empirically using survey data for 1997. As in Cord and Wodon (2001), we use state-level measures of the availability of Procampo as an instrumental variable in order to control for the potential endogeneity of

the decision to participate in Procampo with respect to the decision to migrate. We find a negative impact of Procampo on permanent migration (significant at the 5 percent level), and weaker evidence of a similar impact on temporary migration (the impact is significant only at the 10 percent level, but the magnitude of the impact is larger than for permanent migration).

2. Model

A farmer produces a good according to the production function *f(k)*, where *k* is the capital available. More capital yields more production ($f'(\cdot) > 0$) and in each period capital can be increased through investment i_t, with $k_{t+1} = k_t + i_t$. We assume that the farmer cannot borrow money to invest because markets are incomplete. The farmer's utility depends on the household consumption and each period he chooses how much to invest and how much to consume. Denoting the Procampo transfer by *s* and the discount rate by β, the farmer's lifetime utility without migration is:

$$V_t(k_t) = \max_{i_{t+j}} \left\{ \sum_{j=0}^{\omega} \beta^j u\left(f\left(k_{t+j} + i_{t+j-1}\right) + s - i_{t+j} \right) \right\}. \quad (1)$$

where ω is the number of periods left to live for the farmer and $i_{t-1} = 0$.

The utility function $u(\cdot)$ is defined only for positive quantities. It is increasing and concave, with $\lim_{x \to 0^+} u(x) = -\infty$. That is, no consumption in a given period yields infinite disutility. Without migration, the farmer invests i_t at any time *t* according to the first order condition:

$$-u'\left(f(k_t) + s - i_t\right) + \beta V'_{t+1}\left(k_{t+1}\right) = 0. \quad (2)$$

That is, the investment choice is made by equating the marginal disutility of forgone consumption with the marginal increase in the future gains from investments. Since the farmer cannot borrow money, investment has to be non-negative. For low levels of capital, when the disutility of forgone present consumption outweighs any future gains, zero investment may be optimal. In this case, the first order condition for the Kuhn-Tucker problem is $u'(f(k_t)+s) \geq \beta V'_{t+1}(k_t)$.

The farmer has the option to send a member of the household for migration, and get a wage w_m as remittances (for simplicity, we assume that the totality of the wage is remitted; this is not a crucial assumption). Upon migration of a household member, production is reduced by a factor of $\xi \in [0,1)$. In other words, the family can produce only a proportion ξ of $f(\cdot)$ in the household member's absence. The cost of migration is c, but the cost of return migration is assumed to be zero (for Mexican migration to the U.S., the cost of returning to Mexico is low in comparison to the cost of migrating to the U.S.)

Migration can be either temporal or permanent. Temporal migration takes place during only two periods. In the first period the household has to pay for the migration cost. It receives the foreign wage w_m in the second period. We assume that during the first two periods of migration the probability of loosing the Procampo transfer is zero (this will not be true after the second period when considering permanent migration). This assumption simplifies the presentation and has no major effect on the results. The value of temporary migration, denoted by M_t, is defined as:

$$M_t(k_t) = \max_{i_h \forall h \geq t} \{ u(\xi f(k_t) + s - i_t - c) + \beta u(\xi f(k_{t+1}) + s - i_{t+1} + w_m) + \sum_{j=2}^{\omega} \beta^j [u(f(k_{t+j}) + s - i_{t+j})] \}. \quad (3)$$

Under permanent migration, because of the conditions (actual or perceived by the households) to be met for program participation, the farmer loses the Procampo transfer with probability *(1-α)* for each period during which a household member is at the host location. As noted in Cord and Wodon (2001), the requirements to receive the Procampo payments have changed several times since the program's inception. To be eligible for Procampo payments in 1994, farmers could allocate land to any job creation activity. In 1995, payments were restricted to farmers growing one of the nine eligible crops. But the rules changed again after 1995 (our data is from 1997). Still, it is fair to say that in general, it is probably more difficult for households to comply with the program's requirement and to collect the transfers if some household members have migrated. We assume that the probability of receiving Procampo is reduced each year multiplicatively, meaning that at the n^{th} period after permanent migration initially took place, the probability of receiving Procampo is equal to α^{n-2}. Assuming also for simplicity that the wage earned abroad is remitted in its entirety, the value of permanent migration, denoted by P_t, is:

$$P_t(k_t) = \max_{i_h \forall h \geq t} \{ u(\xi f(k_t) + s - i_t - c) + \beta u(\xi f(k_{t+1}) + s - i_{t+1} + w_m) + \sum_{j=2}^{\omega} \beta^j [\alpha^{j-1} u(\xi f(k_{t+j}) + s - i_{t+j} + w_m) + (1 - \alpha^{j-1}) u(\xi f(k_{t+j}) - i_{t+j} + w_m)] \}. \quad (4)$$

If $V_t(k_t) > \max\{P_t(k_t), M_t(k_t)\}$ when *s=0*, there is no migration without the

Procampo transfer. Two situations can be distinguished. First, the current income of the farmer, $f(k_t)$, may be so low that the immediate disutility from the migration cost is larger than the future value of higher investments. This is the case for values of c sufficiently close to $f(k_t)$, since migration would yield a high disutility in the first period. For such farmers, receiving the Procampo transfer would allow the farmer to invest more, and raising the amount of the transfer could at some point increase income enough so that a decision to migrate might be taken even though this could entail a positive probability of losing the Procampo transfer in the future (under permanent rather than temporary migration). The second situation is that of farmers whose current income is already high enough to imply a loss in income by migrating. For these farmers, Procampo only has the effect of promoting higher investment and consumption, without any impact on migration.

Migration is observed only when $V_t(k_t) \leq \max\{ P_t(k_t), M_t(k_t) \}$. For permanent migration to occur, it must be that $P_t(k_t) > M_t(k_t)$. Temporal migration is observed if $M_t(k_t) > P_t(k_t)$. Note that when migration (temporary or permanent) is chosen, the foreign wage must be high enough to make up for the loss in the production at home.

To see the effect of the Procampo transfer on the various choices available to the farmer, we look at the marginal effect of an increase in the transfer. The marginal effect of an increase in the Procampo transfer when there is no migration is:

$$\frac{\partial V_t(k_t)}{\partial s} = \sum_{j=0}^{\omega} \beta^j u'\left(f\left(k_{t+j} + i_{t+j-1}\right) + s - i_{t+j}\right) \tag{5}$$

Under temporal migration, the marginal impact of a higher transfer is given by:

$$\frac{\partial M_t(k_t)}{\partial s} = u'\left(\xi f\left(k_t\right) + s - i_t - c\right) + \beta u'\left(\xi f\left(k_{t+1}\right) + s - i_{t+1} + w_m\right) + \sum_{j=2}^{\omega} \beta^j \left[u'\left(f\left(k_{t+j}\right) + s - i_{t+j}\right)\right] \quad (6)$$

Finally, under permanent migration, the marginal effect is given by:

$$\frac{\partial P_t(k_t)}{\partial s} = u'\left(\xi f\left(k_t\right) + s - i_t - c\right) + \beta u'\left(\xi f\left(k_{t+1}\right) + s - i_{t+1} + w_m\right) + \sum_{j=2}^{\omega} \beta^j \alpha^{j-1} u'\left(\xi f\left(k_{t+j}\right) + s - i_{t+j} + w_m\right). \quad (7)$$

The empirical question examined in the next section is whether an increase in Procampo transfers has a larger impact on temporary or permanent migration. Because an increase in the transfer will increase utility, the three partials (5), (6), and (7) are all positive. But this does not mean that temporary or permanent migration will increase with a higher transfer. We may be in a situation where the expected utility of the household is higher under no migration. And even if this is not the case, there may be cases where the increase in the utility under no migration in (5) will be sufficiently large to shift to this choice (from an initial situation where there is migration) even though the partials for temporary and permanent migration are both positive. Thus, not much can be said from the comparison of (5) with either (6) or (7).

But from the comparison of (6) and (7), there is one prediction which can be made. The marginal impact of higher transfers should be smaller for permanent than for temporary migration. There are two reasons for this. First, the third term on the right hand side of (7) is weighted by α^{j-1} because of the probability of loosing the transfer, while the

third term in (6) is not (the probability of loosing the transfer is zero under temporary migration). Second, still on this third term, for permanent migration to be observed, the marginal utility must be lower (the utility level must be larger) than under temporary migration, because the wage at the host destination must be high enough to compensate for the loss in production observed for permanent migration beyond the two initial periods. All this means that there may be cases where a household initially under permanent migration will shift to temporary migration after the increase in the Procampo transfer. The opposite cannot happen, again because (7) is necessarily smaller than (6).

However, in deriving (5), (6), and (7), we assumed that the impact of higher Procampo transfers on utility is direct only, i.e. that investments are not affected (without this assumption, there would be additional terms in the equations). In other words, we assumed that the optimal *ex ante* investment schedule is the same for both types of migration (and for no migration at all) and that small changes in income through the higher Procampo transfer have negligible effects on investment. This was done for simplicity. Taking into account the impact of higher transfers on investments could reinforce the above results since beyond the initial two periods, the returns to investments are lower under permanent migration, making this option potentially less attractive. This need not necessarily be the case however, depending on the level of the wages at the host destination and their impact on consumption and investment decisions. For example, with high wages at the host decision, households may be able to accumulate more capital, thereby compensating for the loss of productivity due to the loss of one household member. If such is the case, we cannot make any prediction on the impact of higher

transfers when using (6) and (7).

To conclude, the effect of an increase in the Procampo transfer on migration is indeterminate. A higher transfer may help households to attain an income level high enough not to migrate. The extra income from the transfer may also help households with very low levels of capital to finance temporal or permanent migration. A higher transfer may also make it possible for farmers to reach a convex part of the production function if they migrate (i.e., to reach levels of capital yielding higher returns than without migration), in which case temporary migration could take place to reach this higher level of capital. Of course, independently of the impact on migration, higher Procampo transfers increase the welfare of beneficiary households and in some cases their productivity through higher investments.

3. Empirical results

To analyze the impact of Procampo on migration empirically, we use household data from the 1997 ENCASEH, a survey conducted by the staff of the Government agency Progresa. The survey is nationally representative, but we use only the rural sample (2754 observations). The survey has information on a wide range of household characteristics, including temporary and permanent migration by household members, the former observed over a period of one year and the latter over a five year period. We observe in the survey the migration of household members only, not of full households. Temporary and permanent migration affect respectively 10.6 percent and 1.2 percent of the households in rural areas. Summary statistics for temporary and permanent migration, for Procampo

participation, and for the independent variables which will be used in the regression analysis are provided in table 1.

Participation in Procampo may be endogenous with respect to migration. That is, while participation in Procampo may affect migration, migration may also affect participation. If unobserved and therefore omitted variables determine both migration and participation in Procampo, standard regression techniques may yield biased estimates of the impact of Procampo on migration. For example, unobservable variables such as dynamism and an entrepreneurial bent may affect positively both migration and Procampo participation, since both require a pro-active behavior on the part of the household. If Procampo reduces migration either because of the requirements of the program or the because of the financial incentive to remain in rural areas, a regression of the probability of migrating as a function of (among other variables) Procampo participation will underestimate the negative impact of Procampo on migration. We may well be led to believe that Procampo has no impact even if it does actually reduce migration.

To take into account the potential endogeneity of household participation in Procampo with respect to the decision to migrate, we follow Ravallion and Wodon (2000; see also Wodon and Minowa, 2001). We use the availability of Procampo at the state level as a determinant of program participation at the household level, assuming that state level participation in Procampo does not influence household level migration. Denote program participation in Procampo for household i living in state j by the latent variables S^*_{ij} to which corresponds the observed categorical variables S_{ij} which takes a value of one in the case of participation, and zero otherwise. Participation in Procampo depends on household

characteristics (vector X_{ij}, including a constant), and on the availability of the program in the state in which the household lives, denoted by AS_j. This is a continuous variable computed as the share of all Procampo beneficiaries in a state divided by the share of the rural population living in the state. We also include the squared value of that variable in the regressors to allow for non-linearity in the impact of state availability on household participation. Participation in Procampo depends on other geographic characteristics of the state in which the household lives, denoted by Z_j. Given the above, we first estimate the following probit regression for Procampo participation:

$$S^*_{ij} = \gamma_S' X_{ij} + \delta_S' Z_j + \mu_S AS_j + \mu_S AS_j^2 + \varepsilon_{Sij}$$

$$\text{with } S_{ij} = 1 \text{ if } S^*_{ij} > 0 \text{ and } S_{ij} = 0 \text{ if } S^*_{ij} \leq 0 \tag{8}$$

Next, we estimate a probit for migration. Denote permanent migration of household i living in state j by the latent variable P^*_{ij}, and assume that we do not observe P^*_{ij}, but only a categorical indicator P_{ij} taking a value of one in case of migration by at least one member of the household, and zero otherwise. Migration is a function of the household (X_{ij}) and state (Z_j) level variables, and of participation in Procampo:

$$P^*_{ij} = \gamma_P' X_{ij} + \delta_P' Z_j + \alpha_P S^*_{ij} + \varepsilon_{Pij}$$

$$\text{with } P_{ij} = 1 \text{ if } P^*_{ij} > 0 \text{ and } P_{ij} = 0 \text{ if } P^*_{ij} \leq 0 \tag{9}$$

For temporary migration, denoted by M^*_{ij}, we proceed in s similar way:

$$M^*_{ij} = \gamma_M' X_{ij} + \delta_M' Z_j + \alpha_M S^*_{ij} + \varepsilon_{Mij}$$

$$\text{with } M_{ij} = 1 \text{ if } M^*_{ij} > 0 \text{ and } M_{ij} = 0 \text{ if } M^*_{ij} \leq 0 \tag{10}$$

To control for endogeneity, we estimate equations (9) and (10) not with the actual household level Procampo participation indicator on the right hand side, but with the index

value obtained from (8). Using this index value guarantees that our parameter estimates in (9) and (10) are consistent (e.g., Mallar 1977, Maddala, 1983). To show that controlling for endogeneity matters, we also provide the results of equations (9) and (10) obtained with the actual categorical indicator on the right hand side (i.e., without instrumentation).

The results are given in Table 2. The probit regression for the participation in Procampo, corresponding to equation (8), appears in the first two columns of the table. It indicates higher participation in all Mexican regions as compared to the north pacific region (the excluded geographic location in the regression). Some demographic variables (number of babies and absence of a spouse) also influence participation, as do land variables. Home owners have a much higher probability of receiving Procampo payments (perhaps because they also have land), and the larger the amount of land cultivated by the household, the higher the probability of participating (owning the land is not required for participation; cultivating the land is). The role of education is less clear, with positive impacts for the education of the head, and negative impacts for the education of the spouse (perhaps because well educated spouses are more likely to work in the non-farm sector, thereby reducing the reliance of the household on farming). Occupation and state variables matter as well. The availability of Procampo at the state level is a key determinant of household participation, which is what we needed for identification.

Consider now the determinants of migration. Temporary migration is lower in the south and in the north pacific regions. Permanent migration is lower in the center and north pacific regions. Among demographics, for both permanent and temporary migration, the variable with the largest (and significant) impact is the number of adults in the

household (it is easier for some adults to migrate if other adults are available to stay at home with the children). More children (between five and fourteen years of age) leads to a higher likelihood of permanent migration. Temporary migration is more frequent when the head is young, while permanent migration is more frequent while the head is older (but the impact is small). Female headship is strongly associated with permanent migration, but there may be endogenity here (i.e., the permanent migration of male household members is what may have led the household to be headed by a woman). There is some evidence that households with better educated heads or spouses have less temporary migration, probably because they do not need to search for agricultural employment (agricultural day laborers are an important part of the temporary migrants in Mexico, and they tend to lack basic education). Households with indigenous heads are more likely to have members migrating permanently. Home ownership is positively correlated with both permanent and temporary migration, possibly because it suggests higher financial means to send household members. There is also some evidence that households with heads in agriculture are less likely to have members migrating, possibly because of the need to have them working in the fields.

As for the state level variables, apart from the geographic dummies, a higher share of urban population in the state results in more migration, while a higher share of the rural population decreases temporary migration (the sum of the shares of the population in rural and urban areas need not be one because of peri-urban areas.) State with a higher share of their population living in marginalized areas have more migration, as expected. The higher the income level of the state, the lower the temporary migration, again probably because there is less need to find short term agricultural employment elsewhere to survive.

The main result of interest for us is that there is negative impact of Procampo on both temporary migration (significant at the 10 percent level) and permanent migration (significant at the 5 percent level). Had we estimated these equations without taking into account the problem caused by the endogeneity of program participation with respect to the decision to migrate, we would not have observed this effect of Procampo on migration, as indicated by the insignificant coefficient estimates in the so-called naïve probit regressions in table 2. In other words, while our theoretical model suggested that the impact of the Procampo transfers on permanent and temporary migration could have gone either way, the empirical results strongly suggest that the transfers are reducing migration.

4. Conclusion

This paper has provided a simple theoretical model for analyzing the impact on permanent and temporary migration of cash transfers to farmers. The model suggests that the impact on migration of cash transfers to farmers is uncertain a priori. Using household survey data from Mexico, we estimated that Procampo, a large transfer program implemented after NAFTA, did reduce both temporary and permanent migration, although the impact on temporary migration is statistically significant only at the 10 percent level, while the impact on permanent migration is significant at the five percent level.

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Table 1: Summary statistics, Mexico 1997, rural areas

	Mean	Std. Dev.	Minimum	Maximum
Migration and Procampo participation				
Temporary migration	0.106	0.307	0	1
Permanent migration	0.012	0.110	0	1
Procampo participation	0.203	0.403	0	1
Geographic location				
North West	0.125	0.331	0	1
Center West	0.063	0.244	0	1
Center	0.070	0.255	0	1
South and Gulf	0.442	0.497	0	1
Demographics				
Babies	1.379	1.243	0	8
Babies squared	3.445	5.151	0	64
Children	1.312	1.333	0	9
Children squared	3.498	5.834	0	81
Adults	3.466	1.674	0	11
Adults squared	14.815	15.014	0	121
Head female	0.082	0.274	0	1
No spouse	0.106	0.308	0	1
Land and housing				
Number of hectares	2.684	6.006	0	98
Hectares squared	43.267	276.775	0	9604
House owner	0.849	0.358	0	1
Solid ground	0.619	0.486	0	1
Ethnicity and age				
Indigenous	0.155	0.362	0	1
Age of head	44.001	14.242	16	98
Education of spouse				
Some primary education	0.276	0.447	0	1
Primary completed	0.303	0.460	0	1
Higher level	0.106	0.308	0	1
Education of head				
Some primary education	0.363	0.481	0	1
Primary completed	0.284	0.451	0	1
Higher level	0.149	0.357	0	1
Occupation of head				
Head in agriculture	0.374	0.484	0	1
Head employee	0.227	0.419	0	1
Head self employed	0.176	0.381	0	1
Head not paid/cooperative	0.115	0.319	0	1
Geographic variables				
Share urban	61.729	11.101	44.306	93.141
Share rural	8.760	9.871	0.0827	36.143
Share marginal	26.200	14.222	2.769	49.604
Density	66.311	48.638	11.476	554.818
Per capita PIB	6.296	1.703	3.877	19.234

Source: Authors' estimation using Encaseh 1997.

Table 2: Determinants of temporary and permanent migration in rural areas, Mexico 1997, rural areas

	Procampo participation		Temporary with control		Temporary naive		Permanent with control		Permanent naive	
	dF/dX	Std. Er.	dF/dX	Std. Er.	dF/dX	Std. Er.	dF/dX	Std. Er.	dF/dX	Std. Er.
Geographic location										
North West	0.846*	0.170	0.088*	0.039	0.043*	0.023	0.078*	0.040	0.030*	0.018
Center West	1.473*	0.260	0.243*	0.094	0.134*	0.055	0.051*	0.048	0.004	0.007
Center	1.995*	0.300	0.232*	0.117	0.091*	0.057	0.007	0.014	-0.003	0.001
South and Gulf	1.418*	0.289	-0.026	0.025	-0.047*	0.023	0.013*	0.006	0.006	0.005
Demographics										
Babies	0.302*	0.084	0.028*	0.014	0.013	0.010	0.001	0.001	-0.001	0.001
Babies squared	-0.079*	0.024	-0.007+	0.004	-0.003	0.003	0.000	0.000	0.000	0.000
Children	0.030	0.070	-0.002	0.009	-0.003	0.009	0.003*	0.002	0.004*	0.002
Children squared	-0.003	0.020	0.000	0.002	0.000	0.002	-0.001*	0.000	-0.001*	0.000
Adults	-0.006	0.088	0.054*	0.014	0.053*	0.014	0.005*	0.002	0.005*	0.002
Adults squared	0.003	0.010	-0.003*	0.002	-0.003*	0.002	-0.001*	0.000	-0.001*	0.000
Head female	0.014	0.179	-0.027	0.019	-0.028	0.019	0.019*	0.016	0.017*	0.014
No spouse	-0.435*	0.160	-0.009	0.026	0.015	0.028	-0.003	0.001	-0.001	0.002
Land and housing										
Number of hectares	0.184*	0.017	0.009	0.006	0.000	0.002	0.002*	0.001	0.000	0.000
Hectares squared	-0.004*	0.001	0.000	0.000	0.000	0.000	0.000*	0.000	0.000	0.000
House owner	0.510*	0.134	0.039*	0.016	0.019	0.013	0.004*	0.001	0.003	0.002
Solid ground	0.069	0.076	0.005	0.011	0.001	0.011	0.002	0.001	0.001	0.001
Ethnicity and age										
Indigenous	0.041	0.103	-0.024	0.015	-0.026	0.014	0.009*	0.005	0.008*	0.005
Age of head	0.008*	0.003	-0.002*	0.001	-0.002*	0.000	0.000*	0.000	0.000	0.000
Education of head										
Some primary education	0.210*	0.094	-0.002	0.016	-0.012	0.014	0.005*	0.003	0.004	0.003
Primary completed	0.211*	0.105	0.013	0.019	0.002	0.017	0.002	0.003	0.000	0.002
Higher level	-0.104	0.143	-0.030+	0.016	-0.027	0.017	-0.001	0.002	-0.001	0.002

Source: Authors' estimation using Encaseh 1997. Specification: probit. Excluded variables: region North, Head and spouse without education, head without work. Coefficients with * are significant at 5 percent and coefficients with + are significant at 10%.

Table 2 (continued): Determinants of temporary and permanent migration in rural areas, Mexico 1997

	Procampo participation		Temporary with control		Temporary naive		Permanent with control		Permanent naive	
	dF/dX	Std. Er.	dF/dX	Std. Er.	dF/dX	Std. Er.	dF/dX	Std. Er.	dF/dX	Std. Er.
Education of spouse										
Some primary education	-0.142	0.099	-0.012	0.016	-0.004	0.016	-0.002	0.001	-0.001	0.002
Primary completed	-0.371*	0.108	-0.013	0.019	0.007	0.017	-0.002	0.002	0.001	0.002
Higher level	-0.545*	0.166	-0.038+	0.019	-0.015	0.019	-0.003	0.001	-0.002	0.002
Occupation of head										
Head in agriculture	0.054	0.128	-0.031+	0.018	-0.034+	0.018	0.003	0.003	0.003	0.003
Head employee	-0.331*	0.145	-0.013	0.020	0.004	0.020	-0.003	0.001	-0.001	0.002
Head self employed	0.178	0.131	-0.008	0.020	-0.018	0.018	-0.001	0.002	-0.002	0.002
Head not paid/cooperative	0.419*	0.142	-0.019	0.022	-0.037+	0.016	0.005	0.006	-0.001	0.002
State variables										
Share urban	0.024*	0.009	0.005*	0.001	0.005*	0.001	0.000*	0.000	0.000	0.000
Share rural	0.008	0.010	-0.005*	0.002	-0.006*	0.002	0.000*	0.000	0.000+	0.000
Share marginal	0.003	0.011	0.006*	0.002	0.006*	0.002	0.000*	0.000	0.000	0.000
Density	-0.008*	0.002	-0.001*	0.000	0.000	0.000	0.000	0.000	0.000*	0.000
Per capita PIB	-0.033	0.043	-0.029*	0.009	-0.025*	0.009	0.001*	0.001	0.001*	0.001
Availability of Procampo	1.046*	0.271	-	-	-	-	-	-	-	-
Availability squared	-0.254*	0.057	-	-	-	-	-	-	-	-
Procampo actual (1/0)	-	-	-	-	0.009	0.015	-	-	0.001	0.002
Procampo predicted	-	-	-0.050+	0.030	-	-	-0.007*	0.003	-	-

Source: Authors' estimation using Encaseh 1997. Specification: probit. Excluded variables: region North, Head and spouse without education, head without work. Coefficients with * are significant at 5 percent and coefficients with + are significant at 10%.