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MIGRATION AND REMITTANCES EFFECTS ON CONSUMPTION OF THE POOREST: THE MEXICAN CASE

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Resumen

Este trabajo presenta evidencia empírica sobre el efecto de las remesas en los patrones de gasto de hogares rurales que viven en algunas de las zonas más pobres de México. Utilizando datos de las encuestas del programa Progresa-Oportunidades de los años 1997 al 2000, se desarrolla un modelo econométrico que considera el proceso de autoselección involucrado en el fenómeno migratorio, para estimar el impacto que tiene la probabilidad de recibir remesas, internas y externas, en los patrones de gasto de estos hogares. Los resultados señalan que existen efectos significativos en ciertas categorías de gasto. Dichos hallazgos indican que los hogares con mayor probabilidad de recibir remesas tienen mayor propensión a gastar en categorías de gasto relacionadas con la inversión física y humana.
Palabras clave: migración, remesas, consumo, hogares mexicanos
Clasificación JEL: D12, O15

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Abstract

In this work we present empirical evidence to test for the impact of remittances on expenditure patterns in rural Mexican households located in poor areas. Using data from the Progresa-Oportunidades program from 1997 to 2000, we develop an econometric approach that deals with the selection mechanism affecting migration decisions, to estimate the impact that the probability of receiving remittances, internal and external, has on expenditure patterns of rural poor households. Our findings indicate that there are significant effects on some expenditure categories. Household with higher probabilities of receiving internal and external remittances are more likely to spend in expenditure categories like physical and human investments.
Keywords: migration, remittances, consumption, mexican households
JEL Classification: D12, O15

1. Introduction

International migration flows represent an essential component of the current process of globalization. International labor migration has tremendously increased and diversified during the past few decades. According to the International Labor Organization, the number of international migrants increased from 81 million people in year 2000 to 191 million people in 2005 (ILO, 2006). Migratory movements around the world create an international labour market that generates important flow of monetary resources in the form of remittances transferred back to the origin countries. The total value of remittances send to developing countries has doubled over the last five years and reached an estimated USD 167 billion in 2005. The value of remittances is twice as high as international official development assistance (World Bank, 2006). Asia, Latin America and the Caribbean have been among the regions with the highest proportion of remittances received (UN, 2002).

Remittances sent to origin countries are an important financial flow. An understanding of how these migrant and remittance flows affect migrants' origin households is a core element in any assessment of how international migration affects source countries. This understanding is crucial to design

policies aiming to increase the potential of migration and remittances as development tools.

According to data provided by the Banco de México, international remittances transferred to Mexico in 1990 amounted to USD 2.50 billion. By 2008, this figure had grown to USD 25.14 billion. Until the end of the 1980s, international migration was mostly originated in few areas of Mexico. The states with the highest migratory tradition were located at the center-west of the country (Zacatecas, Michoacán, Jalisco and Guanajuato). However, from the beginning of the 1990s, emigration has become widespread throughout the country (INEGI, 2001) and is now a phenomenon affecting most of the municipios in Mexico. Due to its geographical vicinity, the United States has always been the main destination of Mexican migrants. Undoubtedly, migration and remittances flows have grown substantially in the last decades, generating a broad set of economic, political and social effects in both countries (see Unger, 2005).

Mexican emigration to the United States is a complex phenomenon with deep structural and historical roots on both sides of the border. Two of the main forces that have helped to structure the Mexico-US migratory system are: a) push factors related to the supply of Mexican laborers looking for employment and higher income options in the US; and b) pull factors associated with the labor force demand in the American agricultural, industrial and services sectors. Social and cultural factors are also important. Through a cumulative process, the latter link the areas of origin and destination as migration increases and deepens over time. Migrant networks are decisive in reducing costs and risks associated with migratory movements, and in sustaining, recreating and perpetuating these movements (Massey *et al.*, 1994; 1993).

The extraordinary growth of international migration and the monetary flows associated with this phenomenon has prompted social scientists to carry out studies on the diverse effects of migration in source and destination countries. A subject area that has received particular attention is economic development.

The debate on the relationship between migration and development has changed in recent years. In the past, migration was seen as a failure caused by the lack of economic development, or even worse, as a contributor to the vicious circle that reinforced the problems of poverty and economic stagnation in migrant source countries. Recently, a different view has

emerged: migration can contribute to development and may benefit individual migrants and their families. In this approach, migration is taken as part of a virtuous circle in which development can be reinforced, not only in the country of destination but also in the country of origin (Taylor and Martin, 2001). Despite growing acceptance of this proposal, the exact relationship between migration and development remains to be established, both theoretically and empirically (Taylor, 1999; Unger, 2005).

In the Mexican case, there is a wide set of literature that explores possible effects of migration on various development indicators. Amuedo-Dorantes, *et al.* (2007) consider the impact on healthcare expenditures, Esquivel and Huerta-Pineda (2007) look at the impact on poverty, Hanson (2007) looks at labor force participation; Hanson and Woodruff (2003) analyze the impact on schooling, Hildebrandt and McKenzie (2005) and Kanaiupuni and Donato (1999) consider infant mortality, López Córdova (2005) analyzes the impact of remittances on schooling, infant mortality and poverty, Woodruff and Zenteno (2007) look at entrepreneurship.

Few studies have explored the particular case of migration and its effect on the poor. Data on Progresa-Oportunidades, the major antipoverty program in Mexico has been an important source of empirical findings. For instance, Angelucci (2005) considers the impact of Progresa on the level of labor migration. She shows that the two types of tranfers have different impacts on migration: in particular, unconditional cash transfers are associated with increased migration, while conditional cash transfers reduce migration levels of direct beneficiaries, and, in some cases, of whole households. Azuara (2009) examines the sudden drop in the population size and gender composition of Mexican rural villages where the Progesa program was implemented between 1998 and 2005. He finds that the reduction of adult population of males is 6 times higher than for females, a clear sign of a significant increase in the migration patterns of this population. Stecklov *et al.*, 2003 point out that public cash transfers reduce US migration but have little effect on domestic migration. Furthermore, they find that the provision of cash transfers appears to reduce migration partly by reducing the relative deprivation levels of poor households. Shroff (2009) and Keskin (2009) look at the impact of remittances on poverty and income inequality respectively.

This paper offers some empirical evidence on the effect of remittances (internal and external) on poor households' expenditure patterns. It represents a first effort of approaching this relation in an integral manner.

No empirical evidence of possible effects on expenditure patterns exists for the particular case of rural poor. In order to correctly look at migration and remittances impacts on expenditure patterns, the econometric approach that we employ deals with selectivity on migration. The data to estimate the model comes from the evaluation data set of the Progresa-Oportunidades program.

The structure of the paper is as follows. Section two describes some empirical evidence regarding migration and expenditure decisions. Section three describes the data. Section four is devoted to present the empirical model. Section five clarifies some of the estimation issues mainly concerning variables included. Section six presents results on models estimated. Finally, the seventh section presents our conclusions.

2. Remittances and Expenditures in Rural Households

With regard to how remittances are spent and impact economic development, the literature contains three different arguments. One view is based on remittance use surveys and argues that remittances can generate a complete and permanent dependence. In addition, remittances are often used for the acquisition of consumption goods instead of productive investment (Díaz-Briquets and Weintraub, 1991; Cornelius, 1990). The second point of view points out that the receipt of remittances can cause behavioral changes at the household level that may lower their development impact relative to the receipt of income from other sources (Barham and Boucher, 1998). Finally, there is a third recent view sustained by adherents of the New Economics of Labor Migration arguing that remittances contribute to the development of rural communities increasing investments in human and physical capital (Stark, 1991; de Brauw and Giles, 2008).

The first approach offers often, a pessimistic view of the impact of migration on development in migrant-sending areas. Such studies conclude that remittances are not put into productive use and instead, they are conspicuously consumed (Chami *et al.*, 2003; Taylor *et al.*, 1996; Durand and Massey, 1992; and Papademetrious and Martin, 1991). It is possible that this research on remittance use offers a partial and possibly distorted view of how remittances influence demand, due to the assumed fungibility of income. Moreover, it often rests on arbitrary definitions of what constitutes

productive investments: schooling, health and housing expenditures are often left out.

The general argument of the second approach is that a moral hazard problem arises between remitters and recipients. The dependency on these transfers induces recipients to use remittances as a substitute for other income sources. External shocks may lower income from other sources increasing the dependency on remittance transfers, and since they do not represent a capital flow, this may reduce economic activity and growth (Chami *et al.*, 2003).

The third approach provides some evidence of productive uses of remittances in productive investments. Durand and Massey (1992) find that in Mexico, the relative share of remittances spent on productive activities fluctuated considerably from place to place and often reached substantial levels. Often, remittances are also used to overcome capital constraints in sending areas to finance public projects such as parks, churches, schools, electrification, road construction, and sewers (Reichert, 1981; Massey *et al.*, 1987; Goldring, 1990).

Other studies report that remittances have been critical to the capitalization of migrant-owned businesses (Escobar and Martinez, 1990; Massey *et al.*, 1987; Cornelius, 1990). A number of studies from other world regions echo these findings (for a detailed review, see Taylor, *et al.*, 1996). Under the right circumstances, a significant percentage of migrant remittances and savings may be devoted to productive enterprises. Durand and Massey (1992) conclude that, in Mexico "the highest levels of business formation and investment occur in urban communities, rural communities with access to urban markets, or rural communities with favorable agricultural conditions".

Negative findings on the productive impacts of remittances may be attributable in part to poor research designs that do not consider the direct and indirect ways in which remittances may affect rural household expenditures. Recent empirical models have been designed to overcome this problem. These models have been based on econometric techniques that rigorously explore the effect of remittances on household expenditures, considering remittance income or migration as additional explanatory variables in household demand equations.

For instance, Adams (2005) finds evidence that the spending behavior of rural Guatemalan households with remittances was significantly different from that of households without remittances. Specifically, households with remittance income spent less on consumption goods and more on human

and physical capital investments than otherwise similar households without remittance income. Hanson and Woodruff (2003), Borraz (2005), Suarez and Avellaneda (2007), Alcaraz and Chiquiar (2007), Pederzini and Meza (2008) and Cuecuecha (2008) have analyzed the effects of migration and remittances on schooling in Mexico. The general finding is that schooling investments are positively affected. Hildebrandt and Mckenzie (2005) obtain similar results concerning health (see also Alderman, 1996; Edwards and Ureta, 2003; Adams, 2005 and 1998; Yang, 2005; López Córdova, 2004; and Adams *et al.*, 2008).

However, expenditure decisions at the household level are not independent. When a household is deciding whether to allocate or not part of total income to certain market or good it is also taking in account the opportunity cost incurred by not allocating this money to any other alternative. Instead of analyzing possible effects of migration in a particular expenditure category, we built a system of demands that take in account the totality of expenditures decisions inside the household. Specifically, total expenditure is classified and a system of demands that takes in account selection on migration and consumption is estimated. This empirical exercise is made for the particular case of rural poor in Mexico.

The data and empirical modeling approach designed to explore the possible effects of remittances on household expenditure patterns in rural Mexico are described below.

3. The Progresa-Oportunidades Evaluation Data Set

Progresa (currently known as Oportunidades) is the major cash-transfer public program that the Mexican government has undertaken to enhance human capital of poor households. Its objective is to alleviate current poverty through monetary benefits conditioning the transfers to certain human-capital-investments rules. Basically, children in selected households must attend school on a regular basis and visit health centers for inoculations and constant health care. This two components aim to reduce future poverty levels by breaking the vicious circle of poverty in which poor household remain poor because their level of human capital is low. Nowadays, Progresa-Oportunidades covers all municipios in Mexico, beneficiates around 5 million households and has a budget of 40.5 billion pesos in 2009.

This paper uses the dataset collected during years 1997-2000 for evaluating the impact of Progresa on initial beneficiary households.

The early design of Progresa involved the identification of the poorest villages in Mexico. For evaluating purposes a set of 506 rural villages was first identified among seven states in Mexico. These villages were located in extremely poor areas. In 1997 the Mexican government carried out a census of all households in these villages (Encuesta de Características Socioeconómicas de los Hogares, ENCASEH) collecting information on household demographic composition, income and assets to identify poor households. Ultimately, this information was used to calculate per capita incomes to be compared with certain poverty threshold. Households eligible to receive Progresa transfers would be those below this poverty line. Then, 320 villages were randomly selected to receive Progresa transfers during the first two years of the program (summer 1998 - summer 2000) and were assigned to the "treatment group". The remaining 186 villages were assigned to the "control group" and would receive transfers starting in the fall of 2000.

This "quasi experimental" design was necessary to properly evaluate the impact of the program since it was possible to find a comparison group similar (in observables and non observables) to the beneficiary households in all aspects but that do not receive the program. The panel data collected information for about 24 thousand households during this implementation and evaluation process. The resulting experimental data has been used to evaluate program impacts regarding outcomes related to education and health (see Skoufias and Parker, 2001; Schultz, 2001; Buddelmeyer and Skoufias, 2003; Parker *et al.*, 2006; Todd and Wolpin, 2006). The potential selection bias present in treatment and comparison groups is presumably corrected with this randomized design.

A total of six evaluation surveys (Encuestas de Evaluación de Hogares, ENCEL) were carried out from 1998 to 2000, two in each year. They collected information on income, labor, schooling, health, women empowerment, consumption and assets. Though not originally designed to study the migration phenomenon, questionnaires in the October/November surveys collected a very complete data set on migrant characteristics which include demographics such as age, education, marital status, place of residence, date of migration, reason for leaving, job characteristics and whether or not they sent remittances to the origin household. This information allows us to deal with the selection bias affecting the decision to migrate and remit.

Migrants and remittances can be classified into internal and external depending on the place of residence. An individual living in another state in Mexico is classified as internal. Unfortunately, external migrants are those living in another country without a way of knowing which country this is. Since we are focusing in the poorer rural households and given the strength of the traditional Mexico-US migration phenomenon, it is very likely that transfers sent by these individuals are coming from the United States.

When analyzing the effect of remittances on expenditure patterns we must recall that rural households contained in the Progresa dataset are not representative of all rural Mexico. They represent population at the lowest level of the income distribution in Mexico. Generalizing results to the entire rural population would be mistaken. However the availability of this dataset together with the very rich information on migration that it contains represents a valuable opportunity to study the possible effects of this phenomenon on the particular case of expenditure patterns of poor rural households. Migration linkages of poor households can modify in different ways consumption priorities compared to non-poor households. Since they are poor, the extra money at hand represented by a remittance could be used to first satisfy basic needs (or current consumption) instead of devoting this money to certain physical or human capital investment. Since our sample is poor-dominated, this finding would not be a surprise.

We take the annualized values of income and expenditures provided by the ENCEL surveys. We decided to use the second survey of each year (October/November) because it is in these rounds that information of migrant characteristics was collected. Income and expenditure records were adjusted to 2002 prices and divided by the household size to obtain yearly measures in per capita terms. Unfortunately, we could not use data from the ENCASEH census since it did not contain information on household expenditures. We also dropped observations with important missing information. The final sample consists of 63 771 household observations in all of the years.

Table 1 presents some summary statistics for the sample, with households divided by their type-of-migrant condition. 8 313 households (13.0%) reported to have at least one internal migrant while 1 519 (2.4%) had at least one external migrant. 497 households (0.8%) had at least one of each type. It is not surprising that the external migration phenomenon is barely present in this sample. Placing family members in a migrant labor market is, under the view of the New Economics of Labor Migration

(Taylor *et al.*, 2001), a strategy of the households to maximize future income flows. However, households must incur the cost of sending and supporting migrants initially. Poor households are very unlikely to have enough monetary resources to finance such enterprise. In fact, only 33.4% of households having at least one external migrant were receiving Progresa transfers. Clearly, the majority of external migrant households (EMH) are not poor.

Having a migrant is not a sufficient condition for a household to receive remittances. It will depend on the social arrangement that exist between household and migrants. It will also depend on migrant and household characteristics. Actually, only 19% of internal migrant household (IMH) receive remittances. In contrast, 60% of EMH receive external remittances. A similar situation is present for the both migrant households (BMH) group. It seems that external migrants have stronger motivations to remit.

Families tend to be numerous in this sample. The average for non migrant households (NMH) is 5.8; migrant household's average is always above 6 members. They also seem to be long lasting households since the average of kids below 15 years old is always close to 2, meaning that they are likely to be composed by a majority of adult members.

All schooling indicators are low. Household heads have on average no more than 3 years of schooling. Adult household members have on average no more than 4 years of schooling, not even enough to have completed primary education (6 years). In all cases, adult males are slightly better educated than adult females. Literacy, a very basic skill, is not totally adopted as well. Only around 70% of household heads and household members are literate. As expected, a higher proportion of households (14%) are headed by a female in the EMH and BMH categories. This proportion is lower in the NMH and IMH categories.

It is also evident that the indigenous background dominates the sample. In the case of NMH, on average only 32% of household heads and 23% of household members speak Spanish. Interestingly, the lowest percentage is seen in the EMH group with only 7% of household heads and 5% of household members speaking Spanish.

Averages of house and assets variables are also very low. For the case of the NMH category, 7% of households have drainage, 73% have electricity, 62% have farm lands, only 14% have their roof made of concrete, have on average less than 2 rooms and very few have a vehicle of their own. In general, for

Table 1
Summary Statistics of Non-Migrants and Migrant Households

					Mean-difference t-test		
	Not migrants	**Internal migrants**	**External migrants**	**Both migrants**	**Not migrants vs Internal migrants**	**Not migrants vs External migrants**	**Not migrants vs Both migrants**
Hh receive external remittances (1=yes, 0=No)			0.60 (0.49)	0.41 (0.49)			
Hh receive internal remittances (1=yes, 0=No)		0.19 (0.39)		0.16 (0.37)			
Hh receive Progresa Transfers (1=yes, 0=No)	0.44 (0.50)	0.40 (0.49)	0.33 (0.47)	0.35 (0.48)	5.27***	8.62***	4.16***
Hh size	5.77 (2.81)	7.01 (3.06)	6.30 (2.97)	7.91 (3.22)	-34.57***	-6.84***	-14.72***
Numbers of kids below 15 years old	2.34 (2.03)	2.20 (2.05)	1.97 (1.98)	2.33 (2.18)	5.54***	7.20***	0.09
Hh head's schooling	2.92 (3.06)	2.11 (2.37)	2.18 (2.43)	1.84 (2.21)	27.49***	11.50***	10.75***
Hh head's age	48.00 (16.20)	53.09 (12.67)	53.58 (13.29)	55.22 (11.10)	-32.78***	-16.03***	-14.36***
Hh average education of adult females	3.32 (2.85)	3.27 (2.55)	3.43 (2.53)	3.75 (2.25)	1.48	-1.66*	-4.22***
Hh average education of adult males	3.90 (2.99)	3.87 (2.64)	3.81 (2.55)	4.05 (2.51)	0.92	1.29	-1.35
Hh head's sex (1=male, 0=female)	0.90 (0.30)	0.88 (0.33)	0.86 (0.35)	0.86 (0.34)	5.58***	4.38***	2.29**
Hh head speaks spanish (1=yes, 0=No)	0.32 (0.47)	0.29 (0.46)	0.07 (0.26)	0.08 (0.27)	4.18***	34.46***	19.46***
Hh head is literate (1=yes, 0=No)	0.69 (0.46)	0.64 (0.48)	0.69 (0.46)	0.67 (0.47)	8.97***	0.44	0.91
Percentage of hh members literate	0.59 (0.29)	0.67 (0.26)	0.71 (0.25)	0.75 (0.22)	-22.77***	-17.36***	-15.26***
Percentage of hh members that speak spanish	0.23 (0.36)	0.23 (0.36)	0.05 (0.19)	0.06 (0.22)	0.83	36.83***	17.37***
Hh has plumbing (1=yes, 0=No)	0.07 (0.25)	0.07 (0.26)	0.11 (0.32)	0.11 (0.31)	-1.92*	-5.50***	-2.77***
Hh has electricity (1=yes, 0=No)	0.73 (0.44)	0.76 (0.43)	0.87 (0.34)	0.86 (0.34)	-5.17***	-15.86***	-8.61***
Hh owns house (1=yes, 0=No)	0.94 (0.24)	0.97 (0.18)	0.97 (0.18)	0.97 (0.18)	-12.13***	-5.43***	-3.39***
Hh owns farm lands (1=yes, 0=No)	0.62 (0.48)	0.72 (0.45)	0.66 (0.48)	0.73 (0.44)	-18.20***	-2.69***	-5.58***
Average vehicles	0.09 (0.31)	0.10 (0.33)	0.24 (0.45)	0.24 (0.48)	-2.63***	-12.51***	-7.06***
Roof of concrete (1=yes, 0=No)	0.14 (0.34)	0.13 (0.34)	0.21 (0.41)	0.17 (0.38)	2.10**	-6.62***	-1.96**
Roof of asbestos lamina(1=yes, 0=No)	0.12 (0.33)	0.15 (0.36)	0.16 (0.37)	0.20 (0.40)	-6.84***	-3.68***	-3.96***
Roof of bricks(1=yes, 0=No)	0.11 (0.31)	0.11 (0.31)	0.18 (0.38)	0.15 (0.36)	-1.46	-7.09***	-2.73***

Note: ***, ** and * indicate significance of parameters at 0.01, 0.05 and 0.1, respectively.
Source: own elaboration.

Table 1
Summary Statistics of Non-Migrants and Migrant Households (Continued)

					Mean-difference t-test		
	Not migrants	**Internal migrants**	**External migrants**	**Both migrants**	**Not migrants vs Internal migrants**	**Not migrants vs External migrants**	**Not migrants vs Both migrants**
Roof of palm (1=yes, 0=No)	0.13 (0.34)	0.12 (0.32)	0.05 (0.23)	0.06 (0.24)	4.31***	13.27***	6.38***
Average rooms	1.80 (1.12)	2.02 (1.17)	2.23 (1.25)	2.38 (1.19)	-15.81***	-13.27***	-10.87***
Lost crop because of some shock (1=yes, 0=No)	0.32 (0.47)	0.39 (0.49)	0.24 (0.43)	0.25 (0.43)	-11.68***	7.02***	3.91***
Lost farmable land because of some shock (1=yes, 0=No)	0.10 (0.30)	0.12 (0.33)	0.08 (0.27)	0.07 (0.26)	-5.07***	3.43***	2.30**
Male external migrants			1.12 (0.76)	1.13 (0.77)			
Female external migrants			0.37 (0.69)	0.41 (0.68)			
Husband migrated externally (1=yes, 0=No)			0.10 (0.30)	0.05 (0.22)			
Wife migrated externally (1=yes, 0=No)			0.01 (0.08)	0.002 (0.04)			
Mean age of external migrants			22.65 (8.12)	21.82 (7.30)			
Mean schooling of external migrants			6.24 (2.07)	6.21 (2.03)			
Maximum time that a hh member migrated externally			2.28 (2.50)	2.41 (2.63)			
Male internal migrants		0.92 (0.97)		0.71 (0.89)			
Female internal migrants		1.01 (1.00)		1.14 (1.02)			
Husband migrated internally (1=yes, 0=No)		0.02 (0.14)		0.01 (0.11)			
Wife migrated internally (1=yes, 0=No)		0.01 (0.10)		0.01 (0.09)			
Mean age of internal migrants		21.10 (10.21)		19.87 (9.05)			
Mean schooling of internal migrants		6.06 (2.15)		6.21 (2.19)			
Maximum time that a hh member migrated internally		2.72 (4.29)		2.91 (4.32)			
Observations	53,442	8,313	1,519	497			

Note: ***, ** and * indicate significance of parameters at 0.01, 0.05 and 0.1, respectively.
Source: own elaboration.

these variables there is statically significant evidence that migrant households have slightly better average values than non-migrant households.

Rural households, mainly those devoted to agricultural production, are often affected by external shocks that make their income flows unstable. Shocks like droughts, floods, frosts, fires and plagues are actually very common events that may cause important losses in terms of income or assets. As can be seen in Table 1, losing the crop because of some shock is very common: 32% of NMH, 39% of IMH, 24% of EMH and 25% of BMH suffered this loss. Also, nearly 10% of households in all groups were not able to farm because of the appearance of some of these shocks. Households make adjustments to face these events. It will be interesting to evaluate how these losses affect migration and expenditure decisions.

It also seems that gender characteristics are different for each type of migration. External migrants are mainly males while internal migration seems to be a female phenomenon. Though the averages indicate this, it is also evident that the number of migrants that a household decide to send is not high in these sample. Husbands are more likely to migrate externally while wifes are very unlikely to migrate. Age and schooling are very similar between internal and external migrants. Interestingly, the average schooling is higher for migrant individuals than current adult members of the household. The former have enough years of schooling to have completed primary education. This agrees with the NELM (Taylor *et al.*, 2001) which posits that, among household members, better educated people find a higher reward in migrant labor markets and thus are more likely to migrate.

Yearly income and remittance figures by household categories are summarized in Table 2. EMH seem to be moderately dependent on monetary resources coming from abroad, with external remittances representing on average 18.4% of their total income, receiving 1 025.8 pesos per capita per year. IMH are dependent on internal remittances for 4.9% of their total income and receive on average 332.8 pesos per capita. BMH seem to diversify dependence with their share of external remittances in total income is slightly higher, representing 10.4% versus 2.3% of internal remittances. These dependency figures are low compared to other rural household samples. The Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH), a representative nation-wide survey at the national and rural/urban levels, reports a 40% and a 25% dependency of external and internal remittances respectively (see Mora and Arellano, 2009).

Table 2
Income and Remittances Data of Non-Migrant and Migrant Households (pesos)

	Non Migrants	Internal Migrants			External Migrants		
	Total Income	Total Income	Remittances	%	Total Income	Remittances	%
1998	4,373.7	4,435.3	638.3	8.8	7,303.3	895.1	22.5
1999	3,678.6	3,284.9	215.2	3.3	6,109.0	1,022.4	16.0
2000	4,445.0	3,698.7	68.6	2.2	7,088.5	1,152.9	16.7
All years	4,171.9	3,817.6	332.8	4.9	6,857.7	1,025.8	18.4
Obs.	53,442	8,313			1,519		

(Continued)

	Both Migrants					
	Total Income	External Remittances	Internal Remittances	% Ext.	% Int.	% Total
1998	7,418.6	421.6	110.5	15.2	4.4	19.6
1999	4,670.6	330.2	47.9	8.5	2.0	10.5
2000	3,566.3	383.1	36.4	8.4	1.2	9.6
All years	4,979.0	381.4	61.2	10.4	2.3	12.7
Obs.	497					

Source: own elaboration.

Interestingly, every year the EMH group had the highest level of total income. This also agrees with the NELM (Taylor *et al.*, 2001) since it means that external migrant households are not those at the bottom of the income distribution. There is a downward trend on the share of remittances on total income over the years. However the period analyzed is too short to draw conclusions.

Household expenditures were divided in eight categories: Food, Health (medical services, medicines), Education (tuition, materials), Durable Goods (furniture, household equipment and vehicles), Non Durable Goods (household cleaning items, personal care items and clothing), Patrimony (additional constructions/renovations), Farm Animals (cows, goats, pigs, horses, chickens, donkeys, rabbits). This expenditure category is intended

to capture productive investments. The rest of household expenditures are lumped in an Other category, (transportation, fuels, other expenditures, etc.).

Table 3 presents average budget shares for each of the expenditure categories defined. Food, the primary need, occupies the highest proportion of total expenditure for all of the household categories, always above 70%. This means that it remains less than one third of all monetary resources to satisfy the rest of needs that a household has. In fact, the Non Durable Good category represents around 9% of total expenditure. Let us recall that this expenditure category includes another basic need: clothing. When we add Health and Education, it remains less that 10% of total expenditure available to be devoted to capital and productive investments. In fact, the Durable Goods, Patrimony and Farm Animals categories do not represent more than 3% of total expenditure.

Table 3
Average Budget Shares of Expenditure Categories by Non-Migrant and Migrant Households (percentages)

	Not Migrants	Internal Migrants Only	External Migrants Only	Both Migrants	Not Migrants vs Internal Migrants	Not Migrants vs External Migrants	Not Migrants vs Both Migrants
Food	78.86	77.68	73.15	72.98	5.59***	10.91***	6.47***
Health	2.44	2.86	4.20	4.10	-3.82***	-6.17***	-3.45***
Education	1.52	1.59	1.44	1.30	-1.42	0.73	1.14
Durable Goods	0.50	0.48	1.17	1.29	0.60	-3.63***	-2.48**
Non Durable Goods	9.34	9.28	8.98	9.32	0.56	1.72*	0.04
Patrimony	0.96	1.01	2.63	2.01	-0.58	-5.87***	-2.47**
Farm animals	0.15	0.24	0.30	0.20	-3.16***	-1.54	-0.60
Other	6.23	6.88	8.13	8.80	-5.08***	-6.36***	-4.57***
Obs.	53,442	8,313	1,519	497			

Note: ***, ** and * indicate significance of parameters at 0.01, 0.05 and 0.1, respectively.
Source: own elaboration.

There are interesting differences in budget shares across household categories. EMH and BMH devote significantly more of their total expenditure to health care (slightly above 4%) than NMH. There are no significant differences between groups, compared to NMH, regarding expenditures on education.

All migrant household categories expend significantly less on food than NMH while external migrant households (EMH and BMH) expend significantly more on durable goods and patrimony. EMH devote a significantly lower share of their total expenditure (8.98%) to Non Durable Goods compared to NMH (9.34%). Finally, only IMH seem to spend significantly more than NMH in farm animals (0.24% *vs* 0.15%).

Though the differences are not remarkable, migration may have something to do with the way households decide how to spend their monetary resources. The empirical models applied to explore this possibility are next explained.

4. Empirical Model

One of the hypotheses of the NELM theory is that households decide to send a household member to work abroad (internally or externally) because this represents their best strategy to overcome current monetary constraints and increase future income flows. Remittance perceptions may allow recipient households to devote monetary resources to certain markets that otherwise would remain out of their budget.

The previous paragraph implies three decision processes. First, a household must decide, given household characteristics, whether to send or not household members to work abroad. Second, migrant members must decide whether to send or not remittances. This outcome will depend a lot on the type of social arrangement previously established between migrants and households and on migrant characteristics. Third, once the household have received remittances, it must decide the way in which they will be used. This decision will depend again on household profiles. Summarizing, households first select into migration looking for additional income: remittances. If successful, households receive remittances and spend them accordingly to what they consider their priorities.

This context implies a causality relation to take in account in order to obtain a genuine effect of migration and remittances on expenditure patterns: remittances perception could not be observed if there are no migrants associated to the household. Also, households selecting into migration can be different, in observables and unobservables, from households not participating in migration processes. The econometric approach that we

adopt in order to effectively correct this selection bias problem follows closely the ideas of Taylor *et al.* (2003) and Meza and Pederzini (2009).

The decision of household *j* to allocate family members to labor migration *M* will depend on household (*H*) and village characteristics (*V*). This last set of variables is intended to capture migration linkages differentiated by regional areas in Mexico. This relation can be represented by:

$$M_j^* = \gamma_0 + \gamma_1 H_j + \gamma_2 V_j + u_j \qquad (1)$$

where

$M_j = 0$ if $M_j^* \leq 0$; household has no migrants

$M_j = 1$ if $M_j^* > 0$; household has at least one migrant

M^* is the latent variable governing the decision of a household participating in labor migration. Once self selected, a household sees the outcome of perceiving remittances or not. The decision of a migrant to send remittances to their families depends on migrant (*Z*) and household characteristics (*H*) and is represented by:

$$R_j^* = \alpha_0 + \alpha_1 Z_j + \alpha_2 H_j + e_j \qquad (2)$$

where

$R_j = 0$ if $R_j^* \leq 0$; household doesn't receive remittances

$R_j = 1$ if $R_j^* > 0$; household receive remittances

Equation (2) is only seen when $M_j = 1$. These two relationships represent a Probit model with sample selection (Van de Ven and Van Pragg, 1981) that can be solved in two steps:

1. Obtain maximum likelihood estimates of γ from the Probit model depicted in equation (1). For each observation in the sample we calculate the Inverse Mill Ratio $\lambda_j = \phi(\gamma' X_j) / \Phi(\gamma' X_j)$, where X_j is a vector containing H_j and V_j.

2. Estimate equation (2) with λ_j included as an additional regressor to correct for self-selection on migration as follows:

$$R_j^* = \alpha_0 + \alpha_1 Z_j + \alpha_2 H_j + \alpha_\lambda \lambda_j + e_j \qquad \text{for} \qquad M_j = 1 \qquad (3)$$

From equation (3), we obtain the selection-corrected probability of a household to get remittances. The probability of getting remittances for household not having migrants is set to zero. This heckprob procedure solves the potential endogeneaity of migration and remittances and the selectivity bias caused by the fact that not all migrant households receive remittances. Equations (1) and (3) are estimated for internal and external migration independently.

Since they summarize migration and remittances effects, the selection-corrected probabilities from equation (3) for both, receiving internal and external remittances, are our key variables to develop the demand system that will explore possible effects of internal and external migration on expenditure patterns.

A common problem when dealing with consumption data, and especially with disaggregated expenditure categories, is the existence of a large number of zeros in the dependent variable. The reasons for the presence of zeros (see Garcia and Labeaga, 1996) could be a simple infrequency of purchase, a voluntary abstention (selection) and a budged-constrained corner solution.

How to effectively deal with censored expenditure data becomes more complex in a context of several expenditure categories to be modeled. Since censorship is generated by the same dataset and all expenditure categories share several explanatory variables, censored regressions have correlated error terms. Estimating each equation separately leads to inefficient estimators since it fails to take in account the interrelations across equations. Besides, the selection mechanism is not addressed. In a context of a system of equations with limited dependent variables the modeling of the data must be different.

We develop the censored system of demands proposed by Shonkwiler and Yen (1999) (see also Heien and Wessells, 1990; Perali and Chavas, 2000; Lazaridis, 2003 and Jabarin, 2005). The intrinsic assumption is that a selection mechanism takes place when a household is deciding whether to participate in a given market or purchase a given good.

This approach involves a system of equations in which the dependent variables, household expenditure shares, are censored by unobserved latent

variables influencing the decision to spend income on certain consumption categories. In the system, expenditure by household h in market i, e_{hi} is observed only if the household's total desired expenditure on the item exceeds some threshold (*i.e.*, $e_{hi} > 0$). This threshold will depend on the lumpiness of the good as well as opportunity cost that the household is incurring by not expending on some other market. Of course, household priorities also matter. Poor households would prefer to first satisfy basic needs, such as food or current consumption and then, if the budget constraint is not binding, spend on durable goods or physical investments.

Assuming that the stochastic errors are approximately normal with zero means and a finite variance-covariance matrix that is constant over all observations —that is, *iid*— the system of expenditure equations can be estimated with Lee's (1978) multivariate generalization of Amemiya's (1974) two-step estimator.

In a first stage, a probit is independently estimated for participation in each expenditure category.

$$P_{ji}^{*} = f\left(\delta' X_j\right) + u'_{ji} \qquad i = 1,2,3,\ldots,8 \qquad (4)$$

where

$P_{ji} = 0$ if $\quad P_{ji}^{*} e_{ji}^{*} / E_j \leq 0$

$P_{ji} = 1$ if $\quad P_{ji}^{*} e_{ji}^{*} / E_j 0 > 0$

In equation (4), P_{ji} is the latent variable governing the decision of household j to participate in market i and E_j represents total expenditure of the household. Thus, the dependent variable in each probit is equal to 1 if $e_{ji} > 0$ and zero otherwise. X_j is a vector containing household and village characteristics and δ is a vector of parameters to be estimated. Parameter estimates obtained in this first stage are used to calculate $\phi\left(\delta' X_j\right)$ and $\Phi\left(\delta' X_j\right)$ which denotes the standard normal density function and the normal cumulative distribution function respectively.

In a second stage, functions $\phi(\cdot)$ and $\Phi(\cdot)$ are used to generate selection-corrected variables to be included in a system of equations as follows:

$$e_{ji} / E_j = \Phi\left(\delta' X_j\right) f\left(\theta' W_j\right) + \eta_i \phi\left(\delta' X_j\right) + \xi_{ji} \quad i = 1,2,3,\ldots,8 \qquad (5)$$

Where W_j is a vector of household characteristics and θ' is a vector of parameters to be estimated. In practice $f\left(\theta' W_j\right)$ takes a linear form. The set of eight equations depicted in (5) was estimated using the seemingly unrelated regression (SUR) technique as proposed in Shonkwiler and Yen (1999).

Following this approach, the share of each household expenditure category in total expenditure is regressed, against household characteristics and the selection-corrected probabilities from equation (3) for both, receiving internal and external remittances.

5. Estimation Issues

The list of household, individual migrant and village variables used across equations (1) to (5) can be found in Table 4. Household variables are mainly designed to capture human and physical capital assets trough educational, ethnic, wealth and house characteristics.

Since Progresa is the main motivation driving this data, it would be of particular interest to analyze if receiving Progresa transfers has anything to do with migration and expenditure decisions. Thus, this variable is included as part of the household characteristics set in all equations.

As mentioned earlier, rural households are often affected by unpredictable shocks that make their income flows unstable. In agriculture, producers often see their crops lost because of a flood, a drought or a plague. Sometimes, they are not even to farm because of the appearance of some of these external shocks. It would also be interesting to evaluate if these events influence migration and expenditure decisions as well. A couple of variables measuring this are included as part of the household characteristics set.

Motivations to remit are complex. They are obviously driven by migrant and household characteristics. Data availability of migrant's age, schooling, gender, parental relation and migration experience allowed us to explore how these migrant characteristics may influence the decision of a migrant to remit once the household has self-selected into labor migration. Effects might be different for internal and external migration.

Village variables are mainly intended to capture location effects. In addition to household characteristics, migration is also a function of migration networks or contacts with people who have previously migrated.

Table 4
List of the variables used

Household variables
Logarithm of hh size: lnhsize
Hh receives progresa: progresa (1=yes, 0=no)
Numbers of kids below 15 years old: nkids
Hh head's schooling: schoolinghead
Hh head's age: agehead
Hh head's age squared: agehead2
Hh head's sex: sexhead (1=yes, 0=female)
Hh speaks spanish: headspanish (1=yes, 0=no)
Proportion of hh members that are literate: prcliterate
Hh has plumbing: hasplumbing
Hh has electricity: haselectricity
Hh owns the house: ownshouse (1=yes, 0=no)
Hh owns lands: ownslands (1=yes, 0=no)
House's roof made of concrete : roofconcrete (1=yes, 0=no)
House's roof made of asbestos lamina: rooflamasb (1=yes, 0=no)
House's roof made of teja: roofteja (1=yes, 0=no)
House's roof made of palm : roofpalm (1=yes, 0=no)
Hh lost crop because of some shock: sl_crop (1=yes, 0=no)
Hh lost farmable land because of some shock: sl_land (1=yes, 0=no)
Probability of receiving external remittances: prextremit
Probability of receiving internal remittances: printremit
Logarithm of total per capita expenditure: lntotalexppc
Migrant variables
Number of male migrants (internal or external): malemigrants
Number of female migrants (internal or external): femalemigrants
Husband migrated (internally or externally): husbandleft
Wife migrated (internally or externally): wifeleft
Mean age of migrants (internal or external): meanagemig
Mean schooling of migrants (internal or external): meanschoolmig
Maximum years that the hh member left (internally or externally): maxtimeleftmig
Village variables
2000 Migration Index (municipio): migrationindex2000
2000 Nutrition Index (municipio):nutritionindex2000
Mean annual temperature: meanannualtemp
Mean annual precipitation: meanannualprec
Village was randomly selected to receive progresa transfers: vtreatment
Time variables
Dummy for Year=1998: year98
Dummy for Year=1999: year99
Dummy for Year=2000: year00

Source: own elaboration.

In theoretical and empirical works, these networks have appeared among the most important variables driving migration (Taylor *et al.*, 1996). Thus, households in villages where migration histories are traditionally strong are more likely to send migrants. Since there is no such information on the Progresa data set to proxy this, we have used the Migration Index for 2000 calculated at the municipio[1] level by the Consejo Nacional de Población (CONAPO, 2002) which condensates in one single measure several aspects of the Mexico-US migration phenomenon such as the percentage of households with migrants and remittances. The higher the Index the higher the intensity of the migration phenomenon in that municipio. Migrant remittances may also be influenced by village norms to remit. Thus, the Migration Index is also included in the remittance probit equation.

Not only migration intensities differences across villages may matter. We already know that villages in this sample are the poorest in Mexico. In this aspect, they are not systematically different. However, poverty has different faces. Trying to identify an accurate variable to capture differences in wellbeing across villages, we used the Nutritional Risk Index 2000 calculated by the Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán (INCNMNSZ, 2003). This is also a measure that summarizes several demographic and health variables at the household level and it reflects the nutritional situation of the population at a particular municipio. The higher the Index, the higher the nutritional deficiencies of the population.

Mean annual temperatures and mean annual precipitations calculated from period 1971-2000 are also included (Mendelshon *et al.*, 2008) to capture location effects. Finally, we identify villages originally selected to receive Progresa transfers during this evaluation period looking for possible spillovers on migration and expenditure behavior caused by the presence of this Federal program.

The selection-corrected probabilities of receiving remittances obtained from equation (3) and included in equation (5) are already summarizing all possible effects of migration processes. They are our key variables to evaluate possible effects on expenditure patterns. Since the selection bias has been corrected and the endogeneity between migrants and remittances has

[1] The municipio is the lowest level of political administration in Mexico. It is under the state level and comprises several villages.

been solved, results on these particular variables can be interpreted as net exogenous effects of migration and remittances on expenditure patterns.

6. Results

a. Probit Selection Model

Table 5 presents results from the Probit Selection Model estimated with equations (1) and (3). Panel a displays results for the probability of a household having a migrant. Equations for the probability of having external or internal migrants are estimated independently. Several household variables are significant. The logarithm of the household size has a significant positive effect on the probability of having an external or internal migrant with an increase of 0.01 and 0.15 respectively. The higher the number of potential migrants the higher the probability and the economic reward of placing at least one into labor migration.

Interestingly, the fact of receiving Progresa transfers seems to discourage external migration, it significantly decreases the probability of having an external migrant by -0.002. In contrast, the marginal effect of this variable is not significant in the case of internal migrants. Since Progresa transfers represent additional income they can be viewed as a substitute of external remittances. Therefore, the household will have no need of placing members in external labor markets.

Having kids below 15 is also a deterrent for migration. A one-member increase in the number of kids below 15 decreases the probability of having and external and an internal migrant by -0.002 and 0.02 respectively. Since migrants are mainly adults, taking care of children before participating in labor migration could be preferred. Households where the head is a male, speaks Spanish and has more years of schooling are less likely to have migrants, internal or external. As we have seen in the summary statistics, households in the sample are mainly indigenous. These results confirm that among all household those more likely to migrate are also indigenous. The older the household head the higher the probability of having an internal or external migrant. This last result has sense if the main motive of migrants is altruism towards elderly parents staying behind. This might be indicating the existence of an explicit social arrangement between parents and potential

migrants at this stage of the deciding process. An increase in the percentage of household members that are literate significantly increases the probability of having internal and external migrants. This effect is higher in the case of internal migration. Since most of internal migration is urban driven, it is possible to think about higher returns to human capital in urban jobs. Thus, a household with higher levels of human capital will have better chances of success allocating a member in urban labor markets.

Having farm lands encourages internal migration with a significant increase of 0.006 in the probability. Few of the house characteristics result significant. In particular, having the roof made of palm decreases the probability of having internal or external migrants while households with their roofs made of asbestos lamina are more likely to migrate. This confirms that idea that migrant household are those at the bottom of the income distribution (if we use the material roof as a proxy of house wealthiness).

Results regarding the effects of external shocks in migration decisions are of particular interest. For the case of external migration it seems that neither losing farmable land nor losing the crop stimulates migration. Instead, it significantly decreases the probability of having an external migrant. As we have mentioned, to place a migrant in external labor markets households must bear the monetary cost of such process. It is possible that not being able to farm or losing planned income affects the availably of monetary resources that could have been used to finance migration. It is also possible that in this particular situation, the best choice of the household is placing family members in local labor markets (included family production) to alleviate the external shock that income has suffered because the perception of remittances would not be as immediate as the perception of local wages.

Several village characteristics are also significant. As expected the Migration Index is higly significant in the case of external migration. Households in villages where migration linkages are well consolidated are more likely to have external migrants. Since the Migration Index does not capture internal processes it is not surprising that it does not have any effect on internal migration.

Households in villages whit high levels of nutritional risk are also less likely to migrate externally. On the opposite, high nutritional risks stimulate internal migration. High nutritional deficiencies must be associated with lower levels of economic position, even among poor households. So, for households in municipios with high levels of nutritional risk the cost of

bearing external migration might be higher compared to the one needed to finance internal migration. Location effects such as being in a treatment village and climate variables are also significant in some cases, especially for external migration.

Once households select into migration, migrants select into sending remittances. Results of this second stage on our Probit selection model are shown in Panel b of Table 5. Again, several household characteristics result significant. The higher the numbers of household members the lower the probability of sending remittances. This is true for both internal and external migrants. A numerous family might represent several potential income sources as local employees or participants in family production. Household members living abroad may conclude that additional income for the household is not necessary.

Receiving Progresa is not a factor that migrants take in account when deciding whether to send or not remittances. A negative and significant effect would have mean that remittances are effectively view as a substitute for remittances from the migrants' perspective. A one-member increase in the number of kids below 15 significantly increases the probability of sending external and internal remittances by 0.02 in both cases. Thus, once self selected into migration, migrants that probably left children behind are more likely to send remittances. The schooling of the household head significantly increases the probability of sending remittances but just for internal migrants. The age of the household head is negatively associated with the probability of sending internal remittances. Households headed by a male are also more likely to receive internal remittances. Apparently, household head's human capital indicators are only considered by internal migrants. This can be an indicator of differences in the way altruism is determined in each migration process.

As we have seen in the first stage indigenous household are more likely to migrate. Results on this second stage indicate that they are also more likely to receive external remittances. A household where the head speaks Spanish is less likely to receive internal remittances with a significant decrease in the probability of -0.13. Interestingly, the opposite happens for internal remittances with a significant increase of 0.01. Ethnic origins seem to motivate differently internal and external migrants when deciding whether to send or not remittances.

One might also think that external shocks to household income might also motivate migrants to send remittances. This is true when a household loses

Tabla 5
Probit Selection Model for Internal and External Migration
Panel a. Selection on Migration

	Hh has external migrant (1=yes, 0 otherwise)				Hh has internal migrant (1=yes, 0 otherwise)			
	Parameter Estimates		Marginal effect		Parameter Estimates		Marginal effect	
lnhsize	0.361	***11.88	0.011	***11.37	0.763	***39.71	0.146	***40.19
treated	-0.109	***-3.48	-0.003	***-3.51	0.027	*1.70	0.0004	0.10
nkids	-0.051	***-6.16	-0.002	***-6.06	-0.120	***-24.39	-0.023	***-24.04
schoolinghead	-0.022	***-4.12	-0.001	***-4.08	-0.029	***-9.48	-0.006	***-9.54
agehead	0.058	***10.16	0.002	***10.15	0.069	***21.96	0.013	***22.31
agehead2	-0.0005	***-9.46	-0.00002	***-9.44	-0.001	***-19.48	-0.0001	***-19.73
sexhead	-0.144	***-4.21	-0.005	***-3.71	-0.200	***-9.44	-0.042	***-8.68
headspanish	-0.430	***-11.73	-0.012	***-13.62	-0.054	***-3.43	-0.010	***-3.38
prcliterate	0.370	***7.56	0.012	***7.48	0.261	***9.28	0.050	***9.21
hasplumbing	0.055	1.47	0.002	1.39	-0.001	-0.02	-0.001	-0.10
ownshouse	0.087	1.50	0.003	*1.64	0.032	0.92	0.006	0.92
ownslands	0.024	0.94	0.001	0.94	0.031	**2.04	0.006	*1.95
rooflamasb	0.075	**2.39	0.003	**2.25	0.086	***4.44	0.017	***4.35
roofteja	0.141	***4.27	0.005	***3.78	-0.019	-0.87	-0.004	-0.89
roofpalma	-0.238	***-5.20	-0.006	***-6.30	-0.043	**-2.03	-0.007	*-1.78
sl_crop	-0.120	***-4.40	-0.004	***-4.57	0.031	**2.04	0.006	**2.07
sl_land	-0.125	***-3.00	-0.004	***-3.36	-0.011	-0.48	-0.001	-0.35
vtreatment	0.051	*1.72	0.002	*1.73	-0.011	-0.99	-0.006	0.67
migrationindex2000	0.237	***19.76	0.007	***17.16	-0.010	-1.36	-0.001	-0.60
nutritionindex2000	-0.014	***-6.28	-0.0004	***-6.34	0.003	***3.63	0.001	**2.21
meanannualtemp	0.067	***17.77	0.002	***16.39	-0.0001	-0.08	-0.0001	-0.35
meanannualprec	-0.001	***-13.97	-0.00004	***-14.10	-0.0001	***-3.36	0.00001	***-2.84
year99	0.001	0.03	0.00002	0.03	-0.063	***-3.83	-0.011	***-3.60
year00	0.084	***3.02	0.003	***2.91	-0.234	***-13.72	-0.042	***-14.10
Constant	-4.988	***-28.67			-3.944	***-43.13		
Observations	63,771				63,771			

Note: ***, ** and * indicate significance of parameters at 0.01, 0.05 and 0.1, respectively. Log likelihood for Internal Migration: -8, 558.0. Log likelihood for external migration: -27,016.8.
Source: own elaboration.

Tabla 5
Probit Selection Model for Internal and External Migration
(Continued)
Panel b. Selection on the decision to remit

	Hh receives external remittances (1=yes, 0 otherwise)				Hh receives internal remittances (1=yes, 0 otherwise)			
	Parameter estimates		Marginal effect		Parameter estimates		Marginal effect	
lnhsize	-0.317	***-3.24	-0.119	***-2.56	-0.845	***-36.27	-0.142	***-25.90
treated	-0.009	-0.14	-0.003	-0.14	-0.006	-0.36	-0.001	-0.36
nkids	0.047	**2.10	0.018	*1.88	0.135	***23.89	0.023	***19.66
schoolinghead	0.007	0.44	0.002	0.43	0.022	***6.28	0.004	**6.43
agehead	-0.007	-0.38	-0.003	-0.37	-0.061	***-16.36	-0.010	***-17.72
agehead2	0.0001	0.41	0.00002	0.40	0.0005	***15.15	0.0001	***16.00
sexhead	-0.003	-0.03	-0.001	-0.03	0.153	***6.39	0.028	***6.04
headspanish	-0.376	***-2.91	-0.137	***-3.61	0.060	***3.49	0.010	***3.51
prcliterate	-0.151	-1.02	-0.057	-0.96	-0.209	***-6.54	-0.035	***-6.65
hasplumbing	-0.166	*-1.74	-0.061	-1.62	-0.014	-0.50	-0.002	-0.49
ownshouse	0.205	1.22	0.074	1.27	-0.005	-0.12	-0.001	-0.12
ownslands	0.093	1.41	0.035	1.41	-0.015	-0.89	-0.002	-0.89
rooflamasb	0.159	*1.93	0.061	*1.89	-0.096	***-4.52	-0.017	***-4.29
roofteja	-0.037	-0.43	-0.014	-0.42	-0.015	-0.62	-0.003	-0.62
roofpalma	-0.079	-0.60	-0.029	-0.61	0.034	1.47	0.006	1.50
sl_crop	0.145	*1.92	0.055	*1.74	-0.018	-1.11	-0.003	-1.11
sl_land	-0.360	***-3.08	-0.127	***-3.02	-0.017	-0.69	-0.003	-0.68
malemigrants	0.216	***5.37	0.081	***4.43	0.039	***6.54	0.006	***6.04
femalemigrants	-0.142	***-3.16	-0.053	***-2.75	0.006	1.45	0.001	1.44
husbandleft	0.658	***4.55	0.247	***3.84	0.200	***5.32	0.033	***5.02
wifeleft	0.178	0.44	0.067	0.44	-0.074	*-1.69	-0.012	*-1.67
meanagemig	0.018	***4.21	0.007	***3.58	-0.0001	-0.31	-0.00002	-0.31
meanschoolmig	0.023	1.53	0.008	1.50	0.020	***6.52	0.003	***5.94
maxtimeleftmig	0.016	1.27	0.006	1.25	0.004	***3.05	0.001	***3.07
year99	-0.212	***-2.74	-0.078	**-2.51	-0.025	-1.24	-0.004	-1.22
year00	-0.217	***-2.82	-0.080	**-2.47	0.106	***4.37	0.017	***4.74
migrationindex2000	0.088	*1.66	0.033	**2.01	0.013	1.62	0.002	1.61
Constant	-0.329	-0.40			3.826	***33.17		
Observations	2,016				8,810			

Note: ***, ** and * indicate significance of parameters at 0.01, 0.05 and 0.1, respectively. Log likelihood for Internal Migration: -8, 558.0. Log likelihood for external migration: -27,016.8.
Source: own elaboration.

its crops because of some shock since the probability of sending remittances significantly increases by 0.05. However, this result is different when the household could not farm because of some shock with a significant decrease of -0.13. The difference between these results can be due to the fact that when a household loses the crop, it has already incurred in some investments necessary to farm. The crop represents the future income inflow obtained with these investments. When it fails to be materialized this beforehand-projected income does not reach the household unbalancing the monetary resources necessary to satisfy planned expenditures. Here, migrants take the decision of sending remittances to fulfill the missing income caused by unplanned shocks. When the household has not farmed yet, it is still on time to make adjustments and possibly find alternative income sources. Adjustments are easier since investments have not been made. In this case remittances are not as necessary.

Migrant characteristics are also very important determinants when deciding whether to send or not remittances. A one-migrant increase in the number of male migrants increases the probability of sending external and internal remittances by 0.08 and 0.01 respectively. The number of female migrants is associated with a significant decrease in the probability of sending external remittances of -0.05. Male migrants obviously have strong motivations to remit. If the migrant turns out to be the husband, it significantly increases the probability of sending external and internal remittances by 0.24 and 0.03 respectively. Evidently, husbands have at the origin households enough reasons to care about, a wife, children, or even mother and father. This result is not surprising and it is interesting to note that the effect is stronger for the case of external remittances. In contrast, when the wife leaves the household, the probability of sending internal remittances significantly decreases by -0.01. Seeing a wife migrating, especially internally could also be and indicator of an entire family migrating. Thus, strings attached to origin households could be less important as to send remittances.

The average age of migrants has only a positive significant effect in the case of external remittances while the average schooling has it in the case of internal remittances. Finally, migration experience is only important in the case of internal migration. A one-year increase in the maximum years that a migrant has been away significantly increases the probability of sending internal remittances by 0.001.

Results of this second stage are used to calculate the selection-corrected probabilities of perceiving external and internal remittances to be included in our analysis of expenditures patterns described next.

b. Effects on Household Expenditure Patterns

Table 6 presents results for equation (4) where the probability of a household participating in each of the eight expenditure categories is modeled. It is interesting to note the effect that the selection corrected probabilities have on this first stage of estimation. The probability of receiving internal or external remittances has a positive and significant effect on the probability of spending in Health, Durable Goods, Non Durable Goods and Patrimony. Besides, the probability of receiving internal remittances has a positive effect in the probability of spending in Farm Animals. So, this first stage reveals that migration and remittance effects indeed change expenditure decisions. Households linked to these phenomenons are more likely to spend in physical capital categories such as Durable Goods, Patrimony and Farm Animals. Health, a very important human capital component is also beneficiated. As expected, the probability of satisfying current consumption (Non Durable Goods) is also increased meaning that receiving remittances might indeed help households to drop monetary barriers that would otherwise keep them in poverty. Since virtually every household participates in the Food market it is comprehensive that remittances have no effect on this category. Finally, there is no evidence of remittance effects in the probability of spending in Education.

Several household characteristics turned out to be significant. Most of these effects are maintained and consistent in the second stage of the censored system of demands. It rests to evaluate in this second stage the final balance in terms of allocations once the effect of selection on consumption has been taken in account.

Let us first start analyzing some results on household characteristics. Of particular interest are results on the variable indicating if the household receives Progresa transfers or not. It significantly increases the share devoted to Food (0.82%), Non Durable Goods (0.68%) and Durable Goods (5.59%). It seems that Progresa effectively helps households to alleviate the three types of poverty officially defined by the Secretaria de Desarrollo Social (SEDESOL, 2002): Nutritional Poverty, Capabilities Poverty and Patrimony Poverty.

Table 6
Probit Models for Selection on Consumption

	Food		Health		Education		Durable Goods	
	Coef.	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**
lnhsize	1.163	***13.85	0.515	***25.22	0.843	***43.41	0.502	***16.76
progresa	-0.089	-0.80	-0.088	***-4.51	0.178	***10.43	-0.143	***-5.21
nkids	-0.043	-1.45	-0.013	**-2.44	0.131	***29.89	0.009	1.34
schoolinghead	-0.008	-0.50	0.012	***4.66	0.019	***8.57	-0.013	***-3.37
agehead	-0.001	-0.07	-0.017	***-6.17	0.031	***12.48	-0.018	***-4.43
agehead2	-0.00002	-0.15	0.0002	***7.89	-0.0004	***-16.49	0.0001	***2.70
sexhead	-0.231	**-2.22	0.023	0.98	-0.054	***-2.70	0.011	0.33
headspanish	0.231	**2.53	-0.126	***-7.31	0.158	***11.64	-0.008	-0.34
prcliterate	-0.168	-1.44	-0.073	***-2.61	0.389	***15.68	0.076	*1.87
hasplumbing	-0.157	-1.24	0.014	0.56	-0.061	***-2.80	0.034	0.97
haselectricity	-0.063	-0.74	0.082	***4.80	0.118	***8.62	-0.008	-0.35
ownshouse	0.067	0.49	-0.063	**-2.17	0.035	1.43	0.068	1.57
ownslands	0.072	0.92	0.008	0.50	-0.041	***-3.32	0.059	***2.79
roofconcrete	-0.107	-0.93	0.018	0.89	0.073	***4.27	-0.020	-0.72
rooflamasb	0.193	1.51	0.002	0.08	-0.011	-0.62	-0.037	-1.25
roofpalma	0.121	1.06	-0.084	***-3.60	-0.032	*-1.75	-0.041	-1.27
sl_crop	-0.011	-0.13	0.062	***4.05	0.150	***11.63	-0.028	-1.23
sl_land	-0.115	-0.86	-0.001	-0.04	0.063	***3.31	-0.174	***-4.63
prextremit	0.003	0.61	**0.002**	***2.61**	-0.0002	-0.30	**0.002**	***2.64**
printremit	0.0002	0.13	**0.001**	***4.06**	-0.0002	-1.24	**0.001**	***4.36**
lntotalexppc	1.035	***27.16	0.633	***55.33	0.382	***39.67	0.613	***40.32
year99	0.455	***4.62	-0.225	***-13.83	0.120	***8.48	n.a.	n.a.
year00	0.333	***3.82	-0.478	***-26.83	0.036	***2.51	0.482	***23.71
vtreatment	0.158	1.56	0.001	0.06	-0.113	***-6.77	0.081	***3.03
migrationindex2000	-0.141	***-3.28	0.025	***2.93	-0.065	***-8.83	-0.057	***-4.63
nutritionindex2000	0.011	*1.73	0.001	0.89	-0.006	***-5.65	0.008	***4.32
meanannualtemp	-0.008	-0.69	-0.006	***-2.79	-0.014	***-7.25	0.006	*1.95
meanannualprec	-0.0001	-0.52	0.0001	**2.26	0.001	***12.96	-0.0002	**-2.19
constant	-5.454	***-10.85	-5.912	***-47.86	-5.606	***-52.23	-6.792	***-39.60
Log likelihood	-671.92		-22,535.1		-35,278.7		-10,416.3	
R^2	0.51		0.12		0.19		0.11	
Obs.	63,771		63,771		63,771		63,771	

Note: ***, ** and * indicate significance of parameters at 0.01, 0.05 and 0.1, respectively.
Source: own elaboration.

Table 6
Probit Models for Selection on Consumption
(Continued)

	Non Durable Goods		Patrimony		Farm animals		Other	
	Coef.	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**
lnhsize	0.538	***25.04	0.528	***17.82	0.219	***5.42	0.632	***38.92
progresa	0.115	***5.00	-0.104	***-3.83	-0.360	***-9.98	-0.003	-0.18
nkids	0.016	***2.67	0.036	***5.08	0.061	***6.08	-0.019	***-4.75
schoolinghead	0.008	**2.14	0.0001	0.02	-0.022	***-3.97	0.006	**2.56
agehead	-0.0002	-0.07	-0.009	**-2.15	-0.020	***-3.82	0.011	***5.20
agehead2	-0.0001	**-2.01	0.00004	1.00	0.0002	***3.22	-0.0001	***-5.60
sexhead	0.026	1.07	0.041	1.18	0.062	1.32	0.033	*1.82
headspanish	-0.021	-1.09	0.063	***2.69	-0.074	**-2.28	0.026	**2.01
prcliterate	0.228	***7.67	0.205	***4.99	0.004	0.08	0.079	***3.61
hasplumbing	-0.027	-0.88	-0.038	-1.06	0.062	1.31	0.066	***3.20
haselectricity	0.050	***2.65	-0.015	-0.65	0.0001	0.00	0.135	***10.38
ownshouse	0.011	0.31	0.192	***4.09	0.086	1.37	-0.076	***-3.25
ownslands	0.018	1.06	0.063	***3.01	0.001	0.03	0.011	0.93
roofconcrete	0.081	***3.10	-0.076	***-2.67	-0.050	-1.25	0.035	**2.12
rooflamasb	0.033	1.36	0.025	0.89	0.098	**2.56	0.170	***10.45
roofpalma	-0.005	-0.22	0.020	0.64	-0.096	**-2.02	0.057	***3.31
sl_crop	0.091	***4.92	0.060	***2.76	0.091	***3.19	0.003	0.22
sl_land	-0.020	-0.68	-0.306	***-8.07	-0.113	**-2.40	-0.056	***-3.09
prextremit	**0.003**	***3.54**	**0.003**	***3.26**	-0.001	-0.86	-0.001	-1.38
printremit	**0.0005**	***1.80**	**0.001**	***4.71**	**0.003**	***6.87**	**0.001**	***5.07**
lntotalexppc	0.510	***40.94	0.800	***51.29	0.448	***22.54	0.661	***69.49
year99	0.557	***26.92	n.a.	n.a.	n.a.	n.a.	0.267	***19.79
year00	0.433	***22.23	0.297	***14.31	n.a.	n.a.	0.227	***16.59
vtreatment	-0.003	-0.15	0.059	**2.24	0.242	***7.09	-0.066	***-4.27
migrationindex2000	-0.095	***-9.53	-0.064	***-5.24	0.003	0.19	-0.039	***-5.62
nutritionindex2000	0.008	***5.39	0.005	***2.81	0.014	***5.30	-0.015	***-13.77
meanannualtemp	-0.013	***-4.97	0.008	**2.51	-0.002	-0.57	-0.001	-0.54
meanannualprec	0.0001	1.54	-0.0002	***-3.21	0.0002	**2.30	-0.0003	***-6.75
constant	-3.318	***-24.31	-8.755	***-49.17	-5.557	***-24.24	-6.253	***-61.57
Log likelihood	-15,982.4		-10,553.3		-4,980.9		-39,252.1	
R^2	0.12		0.15		0.07		0.10	
Obs.	63,771		63,771		63,771		63,771	

Note: ***, ** and * indicate significance of parameters at 0.01, 0.05 and 0.1, respectively.
Source: own elaboration.

Results on Health and Education are tricky and must be interpreted carefully: the expenditure shares devoted to health and education significantly decrease if the household receives Progresa by -0.96% and -0.36% respectively. Since Progresa is aimed to increase healthiness of household members, it is then comprehensive that families receiving Progresa will suffer fewer diseases and thus, expend less in medicines and health care. Medical attention that they already have with Progresa has actually no cost. So, they will devote a lower share of their total expenditure to health compared to non-progresa households. Progresa also grants scholarships to children. This also has the general effect of decreasing the share devoted to Education compared to Non-Progresa households.[2]

Other household characteristics agree in general to expectations. For instance, a one-year increase of a household head's schooling decreases the share devoted to food by -0.312% and increases that devoted to education by 0.07%. A one-percent increase in the percentage of literate household members also increases the share devoted to Education (1.83%). A household head being male decreases the share devoted to Education (-0.26%) and Patrimony respectively and increases that devoted to Durable Goods (2.38%), Health (1.13%) and Food (0.5%). Obviously, the higher the level of total household expenditure, the higher the probability of a household participating in each category defined.

Several house characteristics also appear significant. For instance, households with their roofs made of concrete (presumably those with better house conditions) spend significantly more in Health (1.55%), Education (0.04%), Durable Goods (2.29%), Non Durable Goods (0.94%) and Patrimony (1.50%) than otherwise. Having farmable lands has a significant and positive effect of the share devotes to Farm Animal (one of our productive investments categories) with an increase of 2.97%.

External shocks also affect household expenditure allocations. The Patrimony category is the most affected by both, losing the crops and being

[2] Think about a school that charges 100 of tuition (or transportation cost or materials) and also about two children, one that has a Progresa scholarship that reaches a coverage of 80 of tuition and one that has no scholarship. The Progresa child has to devote just 20 of his income (household income) to pay for tuition, while the Non-Progresa child needs to pay 100. Both households have a total budget of 200. If we take Progresa transfers as part of household income, then the Progresa household will have 280. As a share, the Progresa household is devoting 7% of their total income to Education while the Non-Progresa household devotes 36%.

unable to farm because of some shock with significant decreases of -5.2% and -4.5%. Interestingly, this causes an allocation where the Farm Animals category is the most beneficiated with significant increases of 3.37% and 6.03%. Apparently, households focus resources on animal production when agricultural production is not possible.

Moving to our results with respect to the central issue of migration and remittances, we find that a 1% increase in the probability of receiving internal remittances significantly decreases the share devoted to Food (-0.01%), Durable Goods (-0.04%) and Non Durable Goods (-0.003%). However, we find no evidence of positive effects on any of the expenditure categories but other. An increase in the probability of receiving external remittances by 1% significantly decreases the share devoted to Food (-0.02%) and Education (-0.01%) and increases the share expended on Patrimony (0.04%) and Farm Animals (0.09%).

These results contrast with Mora and Arellano (2009) who found, using a similar approach, evidence of significant effects in most of expenditure categories defined. Their general result is that internal remittances seem to stimulate more categories related to human development investments, health and education, while external remittances affect positively physical capital investments. However, results of the present study seem to indicate that internal remittances have no positive relation with neither human capital nor physical capital investments. External remittances do have a positive effect on physical capital investments (Patrimony and Farm Animals) but appear with a negative and significant effect on Education.

To understand these results an integral analysis must be made. The first stage has revealed that households receiving remittances are more likely to spend in certain categories. In particular, households receiving internal remittances are more likely to spend in health, a human capital category, and all physical capital categories defined (durable goods, patrimony and farm animals). External remittances also motivate health expenditures and physical capital investments (durable goods and patrimony).

However, the second stage indicates that the final allocation of monetary resources between expenditure categories, with remittances at hand and once selected into consumption is almost not affected. Let us recall that households still have a fixed budget, even taking in account remittances received. Let us also recall that their income profile is low and additionally, some of them are being subject of conditional cash transfers that also alter

expenditure decisions, especially those of health and education. All these factor combined may cause different allocations that may end up with expenditure mixtures (shares) unchanged or even decreased but these doesn't indicate that their well being is worsen off or unaffected by the remittance perception. A household receiving external remittances can be spending more in certain category but the share of total expenditure devoted to it can remain unaffected.

Consequently, our results suggest that remittances increase the probability of households participating in several human and physical capital variables. Internal remittances motivates a more active participation in health and all human and physical categories. External remittances motivate participation in health, durable goods and farm animals. In all cases, the effect of external remittances is higher than that of internal remittances. Evidently, remittance perceptions allows recipient households to devote monetary resources to certain markets that otherwise would probably remain out of their budget.

Despite this obvious increase in well being of households, the final balance obtained in this exercise indicates that, all factors combined, the effect of internal and external migration and remittances is strong enough to have significant effects only in few expenditure categories.

7. Conclusions

In this work we develop an empirical exercise that explores possible effects of migration and remittances on expenditure patterns of households located in the poorest villages of Mexico. Several attempts of establishing the relation between these phenomenons and the way through which they affect expenditure decisions have been made. However, most of the time an independent approach is used and a single part of the complete history is analyzed. We adopted and integral approach that divides total expenditure in categories of interests looking not just for significant effects on current consumption but also on concepts strongly related to human and economic development.

The evaluation data set for Progresa-Oportunidades represented a great opportunity to look for these effects since no attempts have been undertaken to analyze the particular case of poor households. The econometric approach we used allowed controlling for the potential selection biases arising from

Table 7
Censored System of Demands, Seemingly Unrelated Regressions

	Food		Health		Education		Durable Goods	
	Coef.	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**
lnhsize	-7.143	***-48.98	-1.318	***-3.26	-0.381	***-3.02	3.215	***4.71
progresa	0.823	***8.51	-0.964	***-2.85	-0.358	***-5.92	5.590	***11.70
nkids	0.076	**2.14	-0.304	***-2.75	0.186	***7.79	-1.501	***-9.46
schoolinghead	-0.117	***-6.04	0.150	***3.13	0.073	***6.8	-0.149	*-1.77
agehead	0.198	***11.53	0.078	1.42	0.103	***6.83	-0.253	**-2.47
agehead2	-0.001	***-8.90	0.001	1.35	-0.001	***-7.03	0.003	***3.54
sexhead	0.504	***3.38	1.129	**2.39	-0.261	**-2.18	2.386	***2.86
headspanish	0.667	***6.41	-2.050	***-5.36	0.077	1.18	-7.044	***-12.90
prcliterate	-1.775	***-9.79	-1.077	*-1.87	1.831	***12.19	8.421	***8.37
hasplumbing	-1.515	***-8.14	2.134	***4.51	0.363	***3.08	-3.426	***-4.37
haselectricty	-2.219	***-20.15	2.824	***7.25	0.607	***8.30	5.603	***10.18
ownshouse	1.392	***6.69	-1.325	**-2.11	-0.400	***-2.94	-1.336	-1.16
ownslands	-0.791	***-7.78	-1.313	***-4.15	-0.136	**-2.10	-2.210	***-4.38
roofconcrete	-1.825	***-12.32	1.551	***4.21	0.411	***4.80	2.290	***3.81
rooflamasb	-2.462	***-16.93	2.011	***4.72	0.141	1.57	5.034	***6.73
roofpalma	1.526	***10.86	-1.476	***-2.58	-0.367	***-3.89	6.597	***8.52
sl_crop	-1.057	***-9.93	2.774	***8.83	0.477	***7.23	-0.189	-0.33
sl_land	0.226	1.40	1.871	***3.72	0.204	**2.16	11.917	***10.62
prextremit	**-0.019**	***-3.44**	0.005	0.45	**-0.014**	***-4.18**	0.006	0.35
printremit	**-0.011**	***-6.87**	0.006	1.36	-0.001	-1.01	**-0.041**	***-5.59**
lntotalexppc	-6.095	***-68.97	-1.702	***-12.21	-0.211	***-5.89	0.861	***4.13
year99	-2.241	***-13.84	0.299	***3.41	0.040	1.06	-0.462	***-11.6
year00	-4.058	***-24.81	0.788	***8.17	0.034	0.91	-0.185	***-4.23
$\phi(\delta' X_j)$	-65.926	***-50.71	28.712	***49.49	2.747	***14.55	1.005	1.47
_cons	131.889	***168.65	-2.303	***-20.36	-0.188	***-3.76	-0.045	-1.19
R^2	0.12		0.06		0.06		0.09	
Obs.	63,771		63,771		63,771		63,771	

Note: ***, ** and * indicate significance of parameters at 0.01, 0.05 and 0.1, respectively.
Source: own elaboration.

Table 7
Censored System of Demands, Seemingly Unrelated Regressions (Continued)

	Non Durable Goods		Patrimony		Farm animals		Other	
	Coef.	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**
lnhsize	0.482	***3.95	5.626	***8.08	-0.443	-0.44	0.994	***4.40
progresa	0.689	***8.77	-4.689	***-9.04	-0.497	-0.57	-0.865	***-5.49
nkids	0.097	***3.40	0.560	***3.20	-0.536	**-2.13	-0.490	***-8.68
schoolinghead	-0.012	-0.83	-0.301	***-3.76	0.379	***2.64	0.098	***3.50
agehead	-0.113	***-7.69	-0.404	***-3.77	0.147	1.02	0.036	1.18
agehead2	0.0004	***3.09	0.003	***3.34	-0.002	-1.17	-0.0003	-1.11
sexhead	-0.176	-1.37	-3.079	***-3.48	0.924	0.72	-0.893	***-3.43
headspanish	-0.033	-0.39	1.431	**2.48	-3.074	***-3.61	0.174	0.97
prcliterate	1.272	***8.21	-11.356	***-10.7	-8.687	***-6.21	0.490	1.52
hasplumbing	0.852	***5.86	-1.849	**-2.09	4.286	***3.97	0.654	**2.50
haselectricty	0.406	***4.52	-2.844	***-4.73	-1.587	*-1.85	1.290	***6.37
ownshouse	-0.118	-0.72	-4.460	***-3.18	1.963	0.99	-1.529	***-4.73
ownslands	0.802	***9.71	1.184	**2.19	2.986	***3.87	-0.100	-0.61
roofconcrete	0.939	***8.40	1.499	**2.30	0.419	0.43	0.806	***3.77
rooflamasb	0.772	***6.79	-2.894	***-3.89	0.822	0.87	1.874	***8.66
roofpalma	-1.353	***-11.67	-4.632	***-5.84	-2.255	-1.49	0.214	0.87
sl_crop	0.147	*1.70	-5.215	***-9.56	3.366	***4.57	0.020	0.12
sl_land	-0.489	***-3.86	-4.511	***-3.79	6.028	***4.19	0.834	***3.27
prextremit	0.001	0.29	**0.036**	**2.10**	**0.09**	***2.72**	-0.003	-0.33
printremit	**-0.003**	**-2.27**	-0.007	-0.93	0.015	1.52	**0.006**	**2.48**
lntotalexppc	-1.437	***-22.01	6.371	***27.2	-1.820	***-6.06	0.454	***5.53
year99	3.497	***34.88	-0.934	***-16.4	-0.441	***-20.6	0.587	***5.65
year00	3.105	***32.37	-0.136	**-2.36	-0.389	***-17.8	0.938	***9.03
$\phi(\delta' X_j)$	-5.474	***-6.38	-3.357	***-5.10	10.638	***9.34	19.388	***45.82
_cons	18.829	***28.58	0.302	***6.01	0.226	***9.79	-2.863	***-17.9
R^2	0.07		0.20		0.02		0.04	
Obs.	63,771		63,771		63,771		63,771	

Note: ***, ** and * indicate significance of parameters at 0.01, 0.05 and 0.1, respectively.
Source: own elaboration.

migration and consumption. In addition, a censored system of demands is estimated where the fact that expenditure decisions are not isolated is also taken in account.

Results indicate that household, village and migrant characteristics are important factors driving the decision of a household to allocate member in labor migration markets, internal or external, as well as the decision of migrants in sending money back home. Once selection into migration is accounted for, the probability for a household to participate in several expenditures categories is significantly affected by our key variables summarizing migration and remittances effects: the probability of receiving internal and external remittances.

In particular, household with higher probabilities of receiving internal and external remittances are more likely to participate in the Non Durable Goods category (partially capturing current consumption) and several human and physical capital investments. Specifically, internal remittances significantly encourage participation in health and all physical capital categories defined (Durable Goods, Patrimony and Farm Animals). External remittances also encourage expenditures in Health, Durable Goods and Farm Animals. When compared, the effect of external remittances is higher than that of internal remittances. In contrast with results of Mora and Arellano (2009), the case of poor households seems to indicate that there are no differentiated effects of internal and external remittances. For their particular context, external remittances have stronger effects on both human and physical capital investments.

These findings do not support the view that households receiving remittances disproportionately spend their income on "current consumption". Besides evidence of positive effects on current consumption our findings reveal that remittances influence investments on human and physical capital categories and that a productive use encouraging development is indeed possible.

Besides this first sign of increased well being of households, results also indicate that the effect of internal and external migration and remittances is significant in the final allocation of some expenditure categories. The probability of receiving internal remittances decreases the share devoted to Food, Durable Goods and Non Durable Goods, while the probability of receiving external remittances decreases the share devoted to Food, Education and increases the share expended on Patrimony and Farm Animals.

Several factors might be driving final allocations of expenditures, but we do not consider that the lack of a significant effect or the appearance of a negative one means that households linked with migration processes are worse off. As indicated previously, household receiving remittances are more likely to spend and can be spending more in certain category but at the end the share of total expenditure devoted to it can remain unaffected. This can be comprehensive since their poverty condition implies a budget constraint that might be still binding. This also proofs that rural poor have a different context that must be properly understood to correctly interpret results.

Our findings indicate that internal and external remittances affect household expenditure patterns. These income sources are not fungible and reshape household demands in ways that are independent of total income. They allow households to devote monetary resources in markets or goods that otherwise would remain out of their budget, an important finding, especially for poor rural Mexican households.

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