Implementación, Diseño,
Evaluación y Análisis de Políticas Públicas

Serie Documentos de Trabajo

Numero: DS-001
Área: Desarrollo Social
Título: Juanita's Money Order: Income Effects on Human Capital Investment in Mexico
Autor: Juan Carlos Suárez y Zénida Avellaneda
Fecha: Septiembre, 2005

Juanita's Money Order: Income Effects on Human Capital Investment in Mexico

Juan Carlos Suárez *†
Trinity University
AEA Summer Program 2005

Zénide Avellaneda ‡
University of Wisconsin
AEA Summer Program 2005

September 18, 2005

Abstract

In this paper we investigate income effects on education expenditures in Mexico. We use the *Encuesta Nacional de Ingresos y Gastos de Hogares* (ENIGH) from 1984 until 2004. Specifically, we conduct a test of Friedman's Permanent Income Hypothesis by exploring the difference in the effects of remittances and other types of income on human capital investment in Mexico. In order to identify the permanent and transitory elements in the income of remittance-receiving households, we divide our analysis into four cases. We first divide households according to whether or not their regular income is primarily from agricultural activities, in which case we assume that their regular income has higher variance (and hence less permanence) than income to non-agricultural households. We then subdivide these two cases into households that receive more than half their total income from remittances and those that do not. In this study, remittance is considered to be permanent if it makes up more than half of the household's total income. We find that permanent income, whether in the form of remittances or non-remittance income, has a greater effect on human capital investment decisions than does transitory income in either form. Therefore, we confirm the applicability of Friedman's theory to Mexican data. Furthermore, we show that, for many remittance receivers, remittances are a significant determining factor in the education spending decisions of the Mexican household. Specifically, when remittances function as permanent income, they have a strong positive relationship with education spending per school-age child. This brings new light to the debate on how remittances are spent in Mexico and whether policymakers should encourage remittances and the ease of transfer.

*We would like to thank the faculty and the participants of the American Economic Association Summer Program and Minority Scholarship Program, as well as the participants of the Pipeline Project for their help and encouragement. We would like to give special thanks to Dr. Charles Becker, Dr. Fernando Lozano, Tod Hamilton, Dr. Stanisliav Kolenikov, Dr. Shawn Knabb, Dr. Sudhanshu Handa and Dr. Barry Hirsch for their contributions and advice. In addition we would like to thank Alberto Saracho at Fundacion Idea for his encouragement and help.

†Please send any comments to Juan.Suarez@Trinity.edu & ZLAvellaneda@Wisc.edu .

‡We would like to thank Bro Design (www.BrodyRose.com) for helping us create the figures for this paper.

1 Introduction

We recognize that remittances are an important source
of capital in many countries of the Hemisphere.

Declaration of Nuevo León, January 13, 2004

Remittances are a hot topic in the political arena. At the 2004 Summit of the Americas, the leaders of every nation in North, Central and South America dedicated themselves to finding ways to foster these transfers. Therefore, one can only assume that these leaders have found long-term benefits to their respective countries of allowing migrant workers to support their families from afar. In light of this attitude, it is important to determine how and if remittances truly benefit the Latin American economies.

In this paper, we conduct a test of Friedman's Permanent Income Hypothesis (Friedman, 1957) by exploring the difference in the effects of remittances and other types of income on human capital investment in Mexico. It is important to note that, to test Friedman's Hypothesis, we treat education expenditures as a proxy for investment in human capital. The nature of education spending, especially in a country where returns to education are low, is difficult to classify. This definition is imperfect, but it allows us to analyze education spending in a constructive way.

From an initial regression on the entire population, it is not clear what the relative importance of remittance income versus other types of income is on education spending.[1] In order to identify the permanent and transitory elements in the income of remittance receiving households, we divide our analysis into four cases. We first divide households according to whether or not their regular income is primarily from agricultural activities, in which case we assume that their regular income has higher variance (and hence less permanence) than income to non-agricultural households. This accounts for the intrinsic uncertainty of income from agriculture. We then subdivide these two cases into households that receive more than half their total income from remittances and those that do not. In this study, a remittance is assumed to be permanent if it makes up more than half of the household's total income.

[1] Please refer to Table 8 in Appendix C for these results.

We find that permanent income, whether in the form of remittances or non-remittance income, has a greater effect on human capital investment decisions than does transitory income in either form. Therefore, we confirm the applicability of Friedman's theory to the Mexican data. Furthermore, we show that remittances are a significant determining factor in the education spending decisions of the Mexican household. Specifically, when remittances function as permanent income, they have a strong positive relationship with education spending per school-age child. From this result, one can support the decision of policy-makers to encourage and facilitate these flows.

2 Data Considerations

The data set we use is the *Encuesta Nacional de Ingresos y Gastos de Hogares* (ENIGH).[2] The ENIGH is a bi-yearly survey administered by the Instituto Nacional de Estadística, Geografía e Informática (INEGI) of Mexico. The survey's use of random sampling within predefined geographic areas creates a representative cross-section of the Mexican population. This data set is ideal for our study in that it provides detailed information regarding spending, earnings and investment of households surveyed for 1984, 1989, and even-numbered years from 1992 to 2004. The survey allows us to observe expenditure data in three-month-long periods and income data in six-month-long periods. At a further level of detail, the survey provides information on income and expenditures for households that receive remittances and those that do not.

One shortcoming of the ENIGH is that, while it reports each person's highest level of educational attainment, it does not indicate whether a child is enrolled in school at the time of the survey. Therefore, it does not directly show which households are investing in human capital. To proxy for the household's annual investment in human capital, we use the sum of the household's annual education-related expenditures. To study the same subject, Hanson (2002) uses a child's highest level of educational attainment. This measure of investment on human capital is fitting for Hanson's static analysis. However, since we are interested in how this investment changes over time and with remittances, it is more

[2]The ENIGH is publicly available at www.INEGI.gob.mx.

appropriate to use annual household expenditures on education for this study. This method considers children who attend public school because, while public schools do not charge tuition, families using the public school system make expenditures on school supplies. The ENIGH accounts explicitly for those expenditures.

We narrow the data to consider only those households with children of primary-school age (6-14 years). There are two reasons why we do not include children over the age of 14. First, many children over 15 years of age in Mexico leave school. In fact, the dropout rate for children in primary school (ages 6-12) was 1.5% in 2003, while for children in upper secondary school (ages 15-18), it was 15.9% (Guerra, Siller, and Ortiz, 2004). This is due in part to the fact that the highest level of education that the Mexican government requires children to complete is lower secondary school. The second reason that we do not consider children over the age of 14 is that many children physically leave home after that age, which makes it impossible to tie them to their original households (Hanson, 2002; Psacharopoulos and Ng, 1994).

Throughout our analysis, we use the natural log of income and expenditure data, adjusted to 2002 prices. This minimizes time trends, accounts for inflation and minimizes the skewness of the data. However, in the following section, we do not present the log-peso data; we simply values adjusted to 2002 pesos in order to describe the data.

Other data sets that are commonly used to study remittances are the Mexican Migration Project (MMP) and the Mexican Census. We chose not to use the MMP because the data collection methods used, while appropriate for other studies, would make for a very biased sample in our case. The infrequency with which the Census is conducted makes this data set unattractive for our study. However, it is important to recognize that the ENIGH has a serious weakness as a tool with which to measure remittances. Since the government is the body that creates the survey, respondents have a tax disincentive to report the full amount of the remittances that they receive. Additionally, while the total number of households in our study is very large, when we decompose the sample into subgroups, some of the groups are quite small, thus presenting difficulties in our analysis. However, the completeness of the data set redeems the ENIGH by giving a thorough profile of the household and all of its members, including those abroad.

2.1 Household Income and Education Characteristics

In this section, we provide descriptive statistics about the characteristics of the households sampled and the education expenditures of these households.

Table 1 reports the average per-school-age child education spending for households with school-age children. These data show that the average amount spent per child on education is substantially larger in Mexico City than in any other region. Additionally, on average, remittance-receiving households (RRHH) spend less per school-age child on education than do non-RRHH. This is consistent with Zarate-Hoyos (2004).

Table 1: Means and Standard Deviations of Per-Child Education Expenditure for All Years in 2002 pesos.

Region	Non-RRHH	RRHH	Average
Mexico City	8848	5732	8824
	(20705)	(8892)	(20641)
North	4175	2702	4080
	(10565)	(6979)	(10378)
North-Central	3691	2149	3530
	(10983)	(4587)	(10511)
South-Central	3544	2456	3496
	(10624)	(5709)	(10458)
South	2645	1792	2626
	(8042)	(4735)	(7985)
Average	4028	2417	3938
	(11538)	(5810)	(11300)

From Table 2, one can see that average per-school-age-child education expenditures changed substantially between 1984 and 2004. Just as was the case in Table 1, the average over all years of per-child education spending is lower for RRHH than for non-RRHH. In fact, average spending is lower in every year for RRHH. It is also important to consider education expenditures as a percentage of total expenditures. We consider this metric by

year and region.[3] The ENIGH shows the expenditure share on education is higher in Mexico City than in any other region. Additionally, the standard error of this metric is higher in Mexico City than in any other region reflecting greater degree of income stratification in that region. Also notable is the fact that the mean expenditure share on education changes over the years. Households spent their largest proportion of their income on education in the mid-nineties, and this figure decreased in recent years. In spite of this change we assume time-invariant preferences for education. We might attribute this change over time to any number of factors including changes in government aid programs.

Table 2: Means and Standard Deviations of Per-Child Education Expenditure in 2002 pesos.

Year	Non-RRHH	RRHH	Average
1984	2900	1955	2872
	(7595)	(4194)	(7519)
1989	3139	1668	3079
	(8126)	(3819)	(8001)
1992	3407	1613	3335
	(9313)	(3252)	(9155)
1994	4094	2315	4015
	(14013)	(4954)	(13742)
1996	4155	2792	4075
	(13047)	(5830)	(12742)
1998	3894	2361	3774
	(10336)	(5975)	(10072)
2000	4152	2657	4054
	(10965)	(5242)	(10688)
2002	3967	2332	3843
	(11081)	(6615)	(10815)
2004	5305	3151	5198
	(13409)	(7401)	(13183)
Total	4057	2448	3968
	(11556)	(5873)	(11322)

In Table 3 we see changes in per-capita remittance income over time and between regions. These figures are difficult to summarize because of their large standard deviations. In general, we see that per-capita remittances are higher in the northern regions than in the southern ones. The figures for Mexico City is difficult to interpret because of an anomalously high

[3]Please refer to Table 7 in Appendix C for the relevant table.

value in 1996 and the fact that only one RRHH was surveyed in 1984. The variance over all the states in 2004 than in any other year. This might indicate diversification in the jobs available to migrant workers or an increase in the variety of skill sets among migrant workers.

Table 3: Means and Standard Deviations of Per-capita Remittance Income in 2002 pesos.

Year	Mexico City	North	North-Central	South-Central	South	Average
1984	4221	16890	11651	8295	324	13004
	0	(33598)	(28179)	(9736)	(646)	(29045)
1989	16638	10835	6331	6043	6102	8632
	(21533)	(15068)	(8429)	(7505)	(11022)	(12542)
1992	23153	5908	6823	6566	6404	6674
	(33470)	(7817)	(8464)	(8098)	(5442)	(9491)
1994	6616	5028	5972	3901	2620	5179
	(12627)	(5950)	(8124)	(5302)	(5358)	(6942)
1996	44202	8153	6878	6840	5851	7607
	(86920)	(10130)	(8344)	(8778)	(6210)	(12906)
1998	5144	8066	6443	4409	3556	6572
	(4764)	(14367)	(9040)	(4466)	(4532)	(10742)
2000	3800	7437	7761	7051	8214	7464
	(2974)	(13490)	(16035)	(11448)	(14598)	(13914)
2002	1566	3733	5325	3138	2522	3904
	(4473)	(7994)	(8551)	(7846)	(5037)	(7863)
2004	70501	7322	6701	8235	6969	9450
	(370225)	(10188)	(8676)	(14780)	(10101)	(69124)
Average	24294	6763	6551	5597	4552	6703
	(185592)	(11916)	(10672)	(9969)	(7909)	(29182)

Table 4 shows changes in per-capita non-remittance income from 1984 to 2004, as well as the differences across regions. Here, we see that the average is higher in Mexico City, followed by the northern region. This follows from the substantially higher cost of living in the capital city. In this sample, there is not much change over time in real per-capita income.

With this picture of Mexican households in mind, we will review the situation in a broader context and discuss several studies important to this subject. The reader should bear in mind that variation in the choice of data set might lead to differences between this study and others on the same topic. Furthermore, results stemming from analysis on the national level might not hold for individual regions.

Table 4: Means and Standard Deviations of Per-capita Other Income in 2002 pesos.

Year	Mexico City	North	North-Central	South-Central	South	Average
1984	29944	25339	17609	19035	18477	21433
	(28719)	(38668)	(20751)	(30633)	(20549)	(30910)
1989	31194	27229	18058	15211	14427	21411
	(45905)	(128913)	(27247)	(22234)	(18696)	(79714)
1992	39074	25998	22030	19739	17222	23454
	(74459)	(51809)	(70164)	(59082)	(55864)	(60974)
1994	43312	21781	18673	16130	15176	20804
	(70395)	(40883)	(24267)	(27695)	(29044)	(38312)
1996	32077	22565	15919	13673	15386	18188
	(47713)	(59630)	(20481)	(21353)	(30248)	(39182)
1998	35720	22772	15721	14839	12926	19192
	(77120)	(41654)	(25721)	(30052)	(23185)	(39731)
2000	40118	22069	20798	19374	18036	21155
	(63070)	(30706)	(44432)	(32300)	(46026)	(38639)
2002	29624	21890	19408	15645	15108	19265
	(45816)	(31348)	(35138)	(26570)	(24110)	(31513)
2004	42147	30134	24697	21631	19243	27512
	(108629)	(70686)	(46794)	(64437)	(30395)	(68830)
Average	37315	25068	19414	17488	16242.03	21833
	(77809)	(65433)	(38238)	(40191)	(32641)	(52627)

3 Migration, Remittances and Human Capital Investment in Context

3.1 Migration and Remittances

Mexico has the highest emigration rate of the OECD countries and one of the highest non-refugee emigration rates of any country in the world. In fact, at least 10 million Mexicans live in the US today, and the annual inflow is around 400,000 people. Most often, the explanation for migration lies in the marked wage differential between the two countries. For instance, in 2001, the hourly wage paid to a production worker in the manufacturing sector was five times higher in the US than in Mexico. The difference between US firms and *maquiladoras*, firms where the average wage is about one-third that in other manufacturing firms, is even more dramatic (OECD, 2004).

In 2003, the number of Mexican migrant workers in the US was higher than ever before.

Accordingly, the level of remittances, or earnings from workers in the US sent back to households in Mexico, reached a peak of almost $13.3 billion in 2003. This amount represents 140% of foreign direct investment into Mexico in that year (Coronado, 2004). Clearly, the numbers have changed a great deal since the 1990's, the time period from which our data come. However, our analysis focuses on the preferences of the Mexican household, which we believe have not changed since the 1990's. Furthermore, remittances had just as significant of an effect in both the Mexican economy and household decision-making process during the 1990's as they do now.

3.2 Human Capital Investment and Education Expenditures

Lustig (2001) asserts that investment in the human capital of the poor is the most efficient way for Mexico to grow its way out of poverty. She cites the implementation of the Progresa program of government education grants to poor families in 1997 as an initial effort in this direction. While the Mexican government has, indeed, made an effort in recent years to rectify the problems inherent in its public education system, concerns persist about its education system.

Perhaps the main source of the lack of educational achievement in Mexico is the fact that this country has one of the lowest returns to secondary education of any Latin American country (Psacharopoulos and Ng, 1994). In contrast, Mexico has a high rate of social return to primary and university schooling. This discrepancy between returns to different levels of education mirrors the inherent inequality of Mexican society. The returns to post-secondary schooling increased considerably in the early 1990s, with the trend levelling off toward the turn of the century. In fact, Airola and Juhn (2005) find that industry shifts resulting from international trade and investment actually decreased demand for educated workers in Mexico during the latter part of the 1990s. The relatively low rate of return to secondary schooling might be one of the reasons that households are reluctant to educate their children beyond primary school, let alone send them to the university.

This is not to say that Mexicans are not being educated. In fact, certain parts of the population have made great strides in this regard. However, there are troubling disparities in educational achievement between regions and socio-economic groups. Martin and Solórzano

(2003) attribute the differences between these groups to the increasing degree to which wealthy households opt into private education, thus decreasing the strength of the voice for public education. This lack of accountability in the public education system might be the reason for an increased dropout rate among those remaining.

3.3 Remittances and Human Capital Investment

The body of literature studying the effects of remittances on human capital investments is minimal. The most closely-related work is that of Hanson (2002), who investigates the question of how having a family member working abroad affects the household's investment in human capital using data from the 2000 Mexican Census. Hanson recognizes that having a direct relative abroad might disrupt the family situation and cause children to leave school in order to work. Alternatively, it might increase the income of the household, allowing the family to invest more in the children's human capital. By proxying investment in human capital through accumulated years of schooling, Hanson finds that children in households with migrant workers complete significantly more years of schooling than do children from households without migrant workers. This results of this study, in much the same way as ours, might be troubled by self-selection into migration. That is, people who migrate might do so in order to better their children's educational opportunities.

Zarate-Hoyos (2004) uses the Mexican Income and Expenditure Survey for 1989 and finds that the average remittance-receiving household, both in rural and urban areas, spends less per capita on education than the average non-remittance-receiving household. The study is a broad analysis of how remittance-receiving households spend their remittance income. Therefore, special attention is not paid to any particular category of expenditure. Below, we find that different considerations are relevant to education expenditures than are to other types of spending. In particular, Zarate-Hoyos measures education spending per capita. We find that it is more appropriate to analyze education spending per school-age child. In further contrast to the existing literature, our study looks at education spending on children of ages within a range that has a meaningful definition. Additionally, it uses a definition of investment in human capital different from that of Hanson (2002). Our proxy is a flow variable, thus making it more sensitive to changes in income. This allows us to test the

Permanent Income Hypothesis.

4 Modelling Motivation

We consider the household utility maximization problem to be the same as that of the parents. We justify this decision by arguing that the parent acts as a central planner,[4] thus determining the well-being of each member of the household. Becker (1991) uses a similar approach, and the same idea underlies the overlapping generations model. We define the household utility as :

$$\mathscr{U}_t = \mathscr{U}(C_t, X_t),$$

from which stems the following maximization problem:

$$\max_{C_t, X_t} \sum_{t=0}^{T} \theta^t \mathscr{U}_t,$$

subject to:

$$\begin{aligned} Y_t &= R_t + OI_t \\ W &= \sum_{t=0}^{T} \frac{Y_t}{(1+r)^t} \geq \sum_{t=0}^{T} \frac{P_C C_t + X_t}{(1+r)^t} \end{aligned}$$

Here, θ is the rate of time preference, such that $\theta \in [0, 1]$. Y is total income, R is total income from remittances and OI represents other income. W is the present value of household wealth. We denote all other expenditures by C and the education expenditure by X. The price of all other expenditures is denoted by P_C, and we normalize the price of education to unity. We assume P_C to be constant throughout time. The discount factor is $\frac{1}{1+r}$ such that $r \in [0, \infty)$.

For analytical simplicity, we reduce the problem to the two-period case.[5] The same arguments can be easily generalized to the T-period case. This formulation implies perfect credit markets by considering wealth in present value. Furthermore, we implicitly assume

[4] We owe credit for this formulation to Dr. Charles Becker, who writes, "most kids think their parents are petty dictators."

[5] Please refer to Appendix A for the full derivation of our model.

preferences to be time-invariant. We choose to use Stone-Geary preferences: since we are considering all of the household's expenditures, it is important to include a threshold level of spending. It also recognizes education as a potential luxury good, allowing a demand structure that could generate an income elasticity greater than one and the related non-linear income expansion path. We can then write the problem as:

$$\max_{X_1,X_2,C_1,C_2} X_1(C_1-\tau)^\alpha + \theta X_2(C_2-\tau)^\alpha \tag{1}$$

subject to the inter-temporal budget constraint:

$$X_1 + P_c C_1 + \beta(X_2 + P_c C_2) \leq OI_1 + R_1 + \beta(OI_2 + E[R_2]), \tag{2}$$

where $\beta = \frac{1}{1+r}$ is the discount factor and E is the expectations operator. We use expectations to indicate uncertainty in R_2, which we discuss below. Friedman (1957) states that household income can be subdivided into permanent and transitory income, following from the Permanent Income Hypothesis. Permanent income is the portion of income the household sees as predictable. Transitory income comes from random events and is therefore not easily predictable.[6] Moreover, Friedman assumes that current period permanent income is a function of permanent income in the previous period. It seems natural to entertain the idea that remittances are transitory income. Then, remittance income in the second period is uncertain. We consider both the case where remittance is transitory and when it is permanent. A further assumption in Friedman's Hypothesis is that consumption is a constant proportion of permanent income and, therefore, grows at the same rate as permanent income. Since we are interested in income effects rather than consumption patterns, we make the simplifying assumptions that

$$\frac{OI_2}{OI_1} = k \text{ while } \frac{C_2}{C_1} = 1 \text{ and } \frac{X_2}{X_1} = \gamma. \tag{3}$$

It is important to note that, for the purposes of this paper, we treat education expenditures

[6]Isolated instances of transitory income might be somewhat predictable in that they arise from cyclical or structural changes in the economy.

as consumption at the same time that we use it to proxy for investment in human capital. The nature of education spending, especially in a country where returns to education are low, is difficult to classify. Substituting equations (3) into (2) and (1), we can express the constrained maximization problem as follows:

$$\max_{X_1,C_1} X_1(C_1-\tau)^{\alpha}+\theta\gamma X_1(C_1-\tau)^{\alpha} \tag{4}$$

subject to :

$$(1+\beta\gamma)X_1+(1+\beta)P_cC_1 \leq (1+\beta k)OI_1+R_1+\beta E[R_2], \tag{5}$$

Taking the ratio of the first order conditions of (4) and substituting into (5), we solve for the Marshallian demand for X_1.

$$X_1(P_C,OI_1,R_1,E[R_2])=\frac{OI_1(1+\beta k)+R_1+\beta E[R_2]-P_C(1+\beta)\tau}{(1+\alpha)(1+\beta\gamma)} \tag{6}$$

In the next section, we apply the underlying theory and the model we have developed to the case of Mexico.

5 Empirical Specification

If we analyze this relationship for the entire Mexican population, we find that the income effects of both remittances and other income are statistically significant.[7] In order to isolate the effects of the different types of income our analysis spans four cases. First, we consider two types of households: agricultural and non-agricultural households. This should allow us to address the possibility that, for agricultural households, other income has a transitory element, reflecting the inherent riskiness of the agricultural business. Unfortunately, the data set does not include an indicator for whether a household considers itself to be in the agricultural business. However, we do observe the amount of income that the family receives from agriculture. Therefore, we consider those households that have any positive amount of agricultural income to be agricultural households. We considered establishing a threshold

[7]Please refer to Table 8 in Appendix C for the results of this regression.

above which a family's agricultural income would have to pass in order to qualify the household as an agricultural one. There are two problems with this approach. First, there is no clear cut-off point at which to place the threshold.[8] Second, the very nature of agricultural income calls the idea into question. This is because we could observe households with very little agricultural income and classify them as non-agricultural households. This might be an erroneous determination; in the case of a farm that had a bad year, the members of the household in the labor force would seek other, temporary employment. Then, agricultural income would be a small proportion of total income, while the family actually was a farming one.

For each type of household (agricultural and non-agricultural), we consider **case 1** where remittance income is transitory and **case 2** where remittance income is permanent.

5.1 Case 1 - Remittances as Transitory Income

For some households, remittances function as compensation for deviation from planned income. In this case, by definition, remittances are not predictable and are, therefore, part of the household's transitory income. Then, $E[R_2]$ is zero. Therefore, remittances in the second period do not affect consumption decisions in the first period. We designate those households with remittances making up less than half of their income as households with remittances as transitory income. We choose this threshold because it appears to be a natural cutoff point in the data.[9] For the low-remittance group, we include those households that receive no remittances, but do have school-age children.

In the case where remittances are part of transitory income, we derive from (6) the estimating equation for the relevant case :

$$X_{1_i} = \phi_0 + \phi_1 OI_{1_i} + \phi_2 R_{1_i} + \Phi_3 \mathbf{V}_i + \nu_i. \tag{7}$$

From (6), we expect to find $\phi_2 > \phi_1$. The term $\mathbf{V}_i$ is a vector of controls containing socio-demographic information of each household. We explain it in detail in section 5.3.

[8] Please refer to Figure 3 in Appendix D for the distribution of percentage of income from agriculture.
[9] Please refer to Figure 2 in Appendix D to see the distribution of percentage of income from remittances.

5.2 Case 2 - Remittances as Permanent Income

For some households, remittances totally replace the income of a working member of the house. In this case, remittances function in the same way that the rest of permanent income does. Households in the high-remittance group are those that receive more than half of their income from remittances.

When remittances are a part of permanent income, $E[R_2]$ is certain. Specifically, $R_2 = gR_1$ where g is the constant growth rate of remittance income. In the case where remittances are part of permanent income, (6) reduces to:

$$X_1(P_C, OI_1, R_1, E[R_2]) = \frac{OI_1(1+\beta k) + R_1(1+\beta g) - P_C(1+\beta)\tau}{(1+\alpha)(1+\beta\gamma)} \tag{8}$$

Here, g is the inter-period growth of remittance income. From (8) we derive the according estimating equation:

$$X_{1_i} = \upsilon_0 + \upsilon_1 OI_{1_i} + \upsilon_2 R_{1_i} + \Upsilon_3 \mathbf{V}_i + \epsilon_i, \tag{9}$$

where $\mathbf{V}_i$ is the same vector of controls as in **case 1**.

It is easy to see that equations (6) and (8) are essentially the same. The main difference between the estimating equations (7) and (9) lies in the coefficient on R_1. Our model shows that υ_2 will be greater than ϕ_2. This follows from the predictability of remittances in the second case. Moreover, ϕ_2 should be less than ϕ_1 while υ_2 should be similar to υ_1. If υ_2 is greater than υ_1, then $k < g$. In this case, we might say that the growth of income opportunities available to migrants is higher in the foreign county than in their home country.

5.3 Controls

Based on previous studies, we create a vector of controls for established determinants of education spending, as well as a determinant of a child's potential returns to education.[10] In general, for Latin American countries, research shows that children living in rural areas, with larger families, with adults who have lower education levels, or with a female household head obtain less schooling. After controlling for household characteristics, the occupation of

[10]Please refer to Appendix B for a list of the variables in the vector.

the head of the household does not seem to have an effect on resources devoted to education (Davis, Handa, Arranz, Stampini, and Winters, 2005; Naercio Aquino Menezes-Filho, 2000). Therefore, we choose not to control for the occupation of the head of the household

We do not use wage data to approximate the returns to additional schooling because the returns to education vary greatly on an individual basis. While a child's mental capacity would be the most obvious determinant of his or her potential returns to education, we do not have a direct measure of this characteristic. Instead, we use the education level of the mother, which Hanson (2002) asserts is correlated with the potential of the child, and we find to be more significant than the father's level of education.

Taylor (2000) finds that migrants who receive benefits from Social Security and other U.S. government assistance programs are 10-15% more likely to remit and that those workers remit, on average, $150-200 more per month than those not receiving benefits. Therefore, the level to which the worker is established in the U.S. might be correlated with the amount that he or she remits. We recognize that it would be useful to control for this, but our data set does not allow for it.

Studies also show that school enrollment rates for families of comparable income are significantly higher in areas that receive Progresa aid than in those that do not (Schultz, 2004). Therefore, we include in our regressions a dummy variable for participation in the Progresa program. While the program was implemented in 1997, it was done so on a small scale. Therefore, the full effect of these transfers would not be seen in the 1998 survey, and we use data for participation in this program for the surveys in the years 2000 and onward.

Extending the idea of controlling for Progresa, we also account for participation in the Procampo program. Procampo is designed to compensate Mexican farmers for the negative effects of NAFTA. Davis, Handa, Arranz, Stampini, and Winters (2005) finds that household structures are significantly different between families that receive Procampo benefits and those that do not. Therefore, the receipt of Procampo might influence the human capital investment decision.

In the vector of controls we include dummies for the year of survey in order to account for time fixed effects. Mexico's economic situation in the mid-1990's is very different from that of the late-1990's. The main difference is the peso crisis at the end of 1994 and the subsequent

recession followed by a strong recovery that affected different sector of the economy quite differently. In the same vein, we account for state-fixed effects. As we can see in Figure 1, the characteristics of the average household vary a great deal by state. For instance, on average, households in south-eastern Mexico have lower remittance income and lower education expenditures, while the average household in states nearer to Mexico City have higher remittances and higher education spending. Additionally, households in the northern region of Mexico have higher remittance income, on average, than households in the southern regions of the country.

Figure 1: Remittance Income and Education Spending Characteristics by State

6 Results and Interpretation

Above we motivated the division of households along agricultural lines. We also made clear why we differentiate households receiving more or less than half their income from remittances. Below we will consider the four resulting cases.

6.1 Non-Agricultural Households

6.1.1 Case 1 - Remittances as Transitory Income

Table 5 reports the results from the regressions for all groups.[11] For non-agricultural households that receive low levels of remittances, we find a positive relationship between remittance income and education expenditures that is significant at the 5% level. The coefficient on other income is significant at the 1% level. From this regression, a 1% increase in remittance income leads to a 0.02% increase in education spending. A 1% increase in other income leads to a 0.44% increase in education spending. This result is consistent with the Permanent Income Hypothesis; for households in which remittance income is relatively unimportant, an increase in remittance has less of an effect on consumption decisions than does an increase in other income. The relatively small magnitude of the coefficient on remittance income reflects the fact that, since remittances are not a reliable source of income for these households, the families do not make consumption decisions based on them. We confirm that the coefficient on remittance income is significantly smaller than the coefficient on other income.[12]

6.1.2 Case 2 - Remittances as Permanent Income

For the non-agricultural households whose remittance income makes up more than half of total income, we find that the coefficients on both remittances and other income are positive and significant at the 1% level. Since both types of income should be important in the decision-making process of these households, this result makes sense. In fact, for the average household in this category, a 1% increase in remittance income leads to a 0.56% increase in education spending, while a 1% increase in other income leads to only a 0.08% increase in education spending. Furthermore, we test and confirm that the coefficient on remittance income is significantly larger than that on other income. This is consistent with our hypothesis that the growth rate of remittance income is higher than the growth rate of domestic income.

[11] See tables 9 and 10 in Appendix C for the significance of the year and state dummy variables.
[12] Please refer to Table 11 in Appendix C for tests on the relative magnitude of coefficients.

Table 5: Regression of Expenditure on Education by Population Group

	Non-Ag. Low RRHH	Non-Ag. High RRHH	Ag. Low RRHH	Ag. High RRHH
Remittance Income	0.02	0.56	0.01	0.30
	(0.01)*	(0.13)**	(0.01)	(0.33)
Other Income	0.44	0.08	0.43	-0.02
	(0.01)**	(0.03)**	(0.03)**	(0.2)
Metropolitan	0.34	0.11	0.34	1.86
Area Dummy	(0.03)**	(0.29)	(0.13)*	(2.00)
Number of school-age	-1.64	-1.40	-0.95	-1.05
children	(0.02)**	(0.14)**	(0.03)**	(0.37)**
Number of people in	-0.25	-0.25	-0.14	-0.10
the Labor Force	(0.02)**	(0.10)*	(0.03)**	(0.20)
School-Age by Labor	0.08	0.07	0.03	0.04
Force Interaction	(0.00)**	(0.03)*	(0.01)**	(0.06)
Level of Education	0.38	0.22	0.29	0.58
of the Mother	(0.02)**	(0.15)	(0.04)**	(0.42)
Marital Status	0.03	-0.70	0.05	1.1
Dummy	(0.04)	(0.32)*	(0.09)	(0.62)
Progresa Dummy	0.17	0.62	0.28	-0.28
	(0.10)	(0.37)	(0.11)*	(0.65)
Procampo Dummy	0.24	-0.63	0.20	0.17
	(0.11)*	(0.50)	(0.07)**	(0.62)
Constant	1.52	-0.20	0.12	2.08
	(0.16)**	(1.56)	(0.32)	(3.55)
Observations	48436	839	9947	143
R-squared	0.26	0.29	0.22	0.42

Significance levels : † : 10% * : 5% ** : 1%

6.2 Agricultural Households

6.2.1 Case 1 - Remittances as Transitory Income

Table 5 also reports the results from the regression for households that receive a positive amount of income from agriculture and less than half of their total income from remittances. We find that coefficient on remittance income is not significantly different from zero. The coefficient on other income is positive and significant at the 1% level. In this case, a 1%

increase in other income leads to a 0.43% increase in education expenditures. Our test shows that the coefficient on other income is significantly different from the one on remittance income.

The results from this case do not support our hypotheses. We anticipated that, for those households with unpredictable remittances and unpredictable other income, the coefficients on the different sources of income would not be statistically different from one another. Our results might stem from the fact that, when agricultural households have bad farming seasons, some have the possibility to find alternative employment, thus supplementing their normal income and making it somewhat stable. In this scenario, other income from agriculture would still be unpredictable, but the household would anticipate that it would have income from another source. Therefore, changes in other income would be, to a degree, more predictable than changes in remittance income, leading to a larger coefficient on other income.

6.2.2 Case 2 - Remittances as Permanent Income

Table 5 gives the results of the regression in the case of agricultural households that receive more than half of their total income from remittances. Again, both of the coefficients are positive, but neither of them is significant. This is most likely due to the extremely small sample size. If the results were to extend to a larger sample, the signs and relative magnitudes of these coefficients would support the Permanent Income Hypothesis. That is, for households where remittance income acts as permanent income and other income does not, the effect on consumption decisions of an increase in other income should not be as large as the effect of an increase in remittance income. This is the result we begin to see in our regression.

6.3 Extension: Comparing Between Expenditure Types

Having tested the Permanent Income Hypothesis on the ENIGH education expenditure data, we would like to compare the income effects on other types of goods. Our goal is to be able to draw a conclusion about the spending patterns of RRHH in Mexico. We run the

same regression as on the education data, allowing the dependent variable to represent expenditures on vice and food expenditures.[13] Vice expenditures include money spent on alcohol and tobacco. It is a commonly-held belief that households underreport this figure in the ENIGH. Assuming that all households underreport by the same percentage, we expect our results to be reliable. In the case of food, we would not expect large coefficients since we regard food as a necessity.

Initial regression results do not support the underlying theory. Most likely, we need to adjust our controls to account for factors that influence decision-making with regards to these types of spending. However, we expect to be able to make statements about the impact of remittances on these expenditures relative to their impact on education expenditures. If we were to find that remittances have a more significantly positive effect on education spending, *ceteris paribus*, than on vices, we would be able to further underline the importance of fostering remittances to Mexico's long-run growth. Comparing between the results of regressing on food and on education, we could comment on the nature of these two goods. Namely, if the coefficients on education were greater than those on food, we might confirm the idea that education is more of a luxury than a necessity.

7 Conclusions

Our data speak in favor of Friedman's Permanent Income Hypothesis. Permanent income, whether in the form of remittances or non-remittance income, has a greater effect on consumption decisions than does transitory income in either form. The evidence is stronger for non-agricultural households. In the case where both types of income were regarded as permanent, we have supported our claim that the effect of remittance income on educational spending is greater than the effect of other income. Our model attributes this difference to a higher growth rate of income for migrant workers in the foreign country than in Mexico.

Moreover, we find that remittances are a significant determining factor in the education spending decisions of the Mexican household. Specifically, when remittances function as permanent income, they have a strong positive relationship with education spending per

[13] See regression results in Table 12 in Appendix C.

school-age child. We acknowledge this may be correlation and not a cause-effect relationship. That is, one reason workers might migrate is to increase human-capital investment through education spending, and households that value education might send family members to the USA to work and remit. If we had panel data, rather than cross-sectional, we might be able to make a causal statement in this regard. Furthermore, we would like to implement econometric methods that will allow us to make statements about causality.

Our results support the hypothesis that remittances are used for productive purposes, at least in non-agricultural households. In the future, we would like to increase the number of agricultural households in our sample in order to make more meaningful statements about the agricultural household's spending decision. Furthermore, we would like to endogenize the remittance decision to create a more realistic model. Due to the close relationship between the variables of interest it is difficult to find instrumental variables that would allow us to correct for endogeneity.

Despite the shortcomings of the current study, we have found meaningful results about the validity of the Permanent Income Hypothesis. These validate the use of Friedman's theory in further studies of decision-making in Mexican households. Most importantly, this study brings new light to the debate on how remittances are spent in Mexico and supports the dedication of policymakers to encourage remittances and the ease of their transfer.

8 Appendices

A Model Derivation

We consider the household maximization problem of:

$$\max_{X_1,X_2,C_1,C_2} \mathscr{U}(X_1, X_2, C_1, C_2).$$

With the assigned Stone-Geary functional form and corresponding constraint, we have:

$$\max_{X_1,X_2,C_1,C_2} X_1(C_1 - \tau)^\alpha + \theta X_2(C_2 - \tau)^\alpha \tag{10}$$

subject to the inter-temporal budget constraint:

$$X_1 + P_c C_1 + \beta(X_2 + P_c C_2) \leq OI_1 + R_1 + \beta(OI_2 + E[R_2]), \tag{11}$$

where $\beta = \frac{1}{1+i}$ is the discount factor. We make the simplifying assumptions that:

$$\frac{C_2}{C_1} = 1, \quad \frac{X_2}{X_1} = \gamma, \quad \frac{OI_2}{OI_1} = k. \tag{12}$$

Substituting equations (12) into (11) and (10), we can express the constrained maximization problem as follows:

$$\max_{X_1,C_1} X_1(C_1 - \tau)^\alpha + \theta\gamma X_1(C_1 - \tau)^\alpha \tag{13}$$

subject to :

$$(1 + \beta\gamma)X_1 + (1 + \beta)P_c C_1 \leq (1 + \beta k)OI_1 + R_1 + \beta E[R_2], \tag{14}$$

Using (13) and (14) and assuming the necessary Karush-Kuhn-Tucker conditions, we can set up the Lagrangian,

$$\mathscr{L} = X_1(C_1-\tau)^\alpha+\theta\gamma X_1(C_1-\tau)^\alpha-\lambda[(1+\beta\gamma)X_1+(1+\beta)P_cC_1-(1+\beta k)OI_1-R_1-\beta E[R_2]], \tag{15}$$

with the following first order conditions:

$$\mathscr{L}_{X_1} \quad : \quad (C_1 - \tau)^{\alpha} + \theta\gamma(C_1 - \tau)^{\alpha} - \lambda(1 + \beta\gamma) = 0, \tag{16}$$

$$\mathscr{L}_{C_1} \quad : \quad \alpha X_1(C_1 - \tau)^{\alpha-1} + \alpha\theta\gamma X_1(C_1 - \tau)^{\alpha-1} - \lambda(1 + \beta)P_c = 0 \quad \text{and} \tag{17}$$

$$\mathscr{L}_{\lambda} \quad : \quad (1 + \beta\gamma)X_1 + (1 + \beta)P_cC_1 - (1 + \beta k)OI_1 - R_1 - \beta E[R_2] = 0. \tag{18}$$

Arranging terms, we can modify (16) and (17) to get :

$$(C_1 - \tau)^{\alpha}(1 + \theta\gamma) = \lambda(1 + \beta\gamma) \quad \text{and} \tag{19}$$

$$\alpha X_1(C_1 - \tau)^{\alpha-1}(1 + \theta\gamma) = \lambda(1 + \beta)P_c. \tag{20}$$

Taking the ratio of (19) to (20), we solve for the Marshallian demand for C_1.

$$C_1 = \frac{\alpha X_1(1 + \beta\gamma)}{P_C 1 + \beta} + \tau \tag{21}$$

Substituting (21) into the budget constraint and solving for X_1 we find:

$$X_1(P_C, OI_1, R_1, E[R_2]) = \frac{OI_1(1 + \beta k) + R_1 + \beta E[R_2] - P_C(1 + \beta)\tau}{(1 + \alpha)(1 + \beta\gamma)} \tag{22}$$

In the case where remittances are part of transitory income, we derive from (22) the estimating equation for the relevant case :

$$X_{1_i} = \phi_0 + \phi_1 OI_{1_i} + \phi_2 R_{1_i} + \Phi_3 \mathbf{V}_i + \nu_i. \tag{23}$$

In the case where remittances are part of permanent income, (22) reduces to:

$$X_1(P_C, OI_1, R_1, E[R_2]) = \frac{OI_1(1 + \beta k) + R_1(1 + \beta g) - P_C(1 + \beta)\tau}{(1 + \alpha)(1 + \beta\gamma)} \tag{24}$$

From (24) we then derive the according estimating equation:

$$X_{1_i} = \upsilon_0 + \upsilon_1 OI_{1_i} + \upsilon_2 R_{1_i} + \Upsilon_3 \mathbf{V}_i + \epsilon_i. \tag{25}$$

B Vector of Control Variables

Table 6: Vector of Household Characteristics

Variable	**Description**
Metropolitan Area Dummy	1 = Urban, 0 =Rural (Urban = $100,000+$)
Number of school-age children	Discrete
Number of people in the Labor Force	Discrete
School-Age by Labor Force Interaction	Discrete
Level of Education of the Mother	0 = None, 1 =Primary, 2 =Secondary, 3 =Tertiary
Progresa Dummy	1 = Participates, 0 =Does not
Procampo Dummy	1 = Participates, 0 =Does not
State Dummies (Abbreviated)	1 =Resident, 0 =Non-resident
1994 Dummy	1 =Year of survey, 0 =Not Year of survey
1996 Dummy	1 =Year of survey, 0 =Not Year of survey
1998 Dummy	1 =Year of survey, 0 =Not Year of survey
Marital Status Dummy	1 =Married, 0 =Not Married

C Additional Statistics, Regression Results and Tests

Table 7: Means and Standard Deviations of Expenditure Share on Education in 2002 pesos.

Year	Mexico City	North	North-Central	South-Central	South	Total
1984	6.1	4.3	4.2	4.8	4.6	4.6
	(7.4)	(6.4)	(6.6)	(6.6)	(7.0)	(6.7)
1989	6.9	5.1	4.7	6.3	4.9	5.5
	(8.8)	(6.8)	(7.4)	(8.6)	(8.4)	(7.9)
1992	8.8	5.3	5.8	7.2	4.8	6.2
	(10.7)	(7.7)	(8.4)	(8.9)	(7.7)	(8.6)
1994	9.7	6.0	7.0	6.7	5.9	6.7
	(11.6)	(8.2)	(9.4)	(9.4)	(8.4)	(9.2)
1996	11.2	8.0	8.0	7.7	7.2	7.9
	(11.9)	(9.2)	(9.9)	(8.8)	(8.9)	(9.4)
1998	9.7	6.6	6.5	7.0	5.5	6.7
	(10.3)	(8.3)	(7.8)	(9.2)	(7.3)	(8.5)
2000	11.9	6.3	7.1	8.3	6.4	7.4
	(10.2)	(7.6)	(8.3)	(9.9)	(7.8)	(8.8)
2002	9.2	6.5	6.5	7.3	6.5	6.9
	(10.8)	(8.8)	(8.9)	(9.0)	(8.5)	(9.0)
2004	3.7	3.1	2.8	3.4	2.7	3.1
	(6.0)	(4.8)	(4.2)	(4.7)	(4.4)	(4.8)
Average	7.6	5.5	6.0	6.5	5.5	6.0
	(9.9)	(7.6)	(8.3)	(8.6)	(7.9)	(8.3)

Table 8: Regression on Entire Population

	Education
Remittance Income	0.03
	(0.00)**
Other Income	0.11
	(0.01)**
Metropolitan	0.33
Area Dummy	(0.02)**
Number of school-age	1.14
children	(0.01)**
Number of people in	0.32
the Labor Force	(0.01)**
School-Age by Labor	-0.17
Force Interaction	(0.00)**
Level of Education	0.39
of the Mother	(0.01)**
Marital Status Dummy	0.09
	(0.03)**
Progresa Dummy	0.26
	(0.07)**
Procampo Dummy	-0.10
	(0.04)*
Constant	-0.94
	(0.08)**
Observations	114477
R-squared	0.15

Table 9: Test for Joint Significance of State Dummy Variables.

States	=	0
F(31, 59315)	=	8.78
Prob > F	=	0.0000

Table 10: Test for Joint Significance of Year Dummy Variables.

Years	=	0
F(8, 59315)	=	52.89
Prob > F	=	0.0000

Table 11: Test for Relative Magnitude of Coefficients by Household Type.

	Non-Agricultural	
Case 1: Low Remittance		
H_0 : Remittance	$>$	Other Income
ϕ_2	$>$	ϕ_1
$t_{(48386)}$	$=$	27.549
Prob $>$ t	$=$	0.0000
Case 2: High Remittance		
H_0 : Remittance	$<$	Other Income
υ_2	$<$	υ_1
$t_{(791)}$	$=$	3.527
Prob $>$ t	$=$	0.0004
	Agricultural	
Case 1: Low Remittance		
H_0 : Remittance	$<$	Other Income
ϕ_2	$<$	ϕ_1
$t_{(4159)}$	$=$	13.867
Prob $>$ t	$=$	0.0000
Case 2: High Remittance		
H_0 : Remittance	$<$	Other Income
υ_2	$<$	υ_1
$t_{(34)}$	$=$	0.707
Prob $>$ t	$=$	0.4808

Table 12: Regression on Population by Expenditure Type

	Education	Food	Vices
Remittance Income	0.03	-0.02	-0.01
	(0.00)**	(0.00)**	(0.00)**
Other Income	0.11	-0.03	0.05
	(0.01)**	(0.00)**	(0.00)**
Metropolitan	0.33	0.06	0.01
Area Dummy	(0.02)**	(0.01)**	(0.01)
Number of school-age	1.14	-0.71	-0.05
children	(0.01)**	(0.01)**	(0.01)**
Number of people in	0.32	-0.59	-0.07
the Labor Force	(0.01)**	(0.00)**	(0.00)**
School-Age by Labor	-0.17	0.13	0.02
Force Interaction	(0.00)**	(0.00)**	(0.00)**
Level of Education	0.39	-0.04	-0.04
of the Mother	(0.01)**	(0.00)**	(0.00)**
Marital Status Dummy	0.09	-0.79	-0.06
	(0.03)**	(0.01)**	(0.01)**
Progresa Dummy	0.26	-0.22	-0.03
	(0.07)**	(0.03)**	(0.03)
Procampo Dummy	-0.10	-0.03	0.02
	(0.04)*	(0.02)	(0.02)
Constant	-0.94	3.90	0.17
	(0.08)**	(0.04)**	(0.04)**
Observations	114477	114477	114477
R-squared	0.15	0.36	0.03

Significance levels : † : 10% * : 5% ** : 1%

D Figures

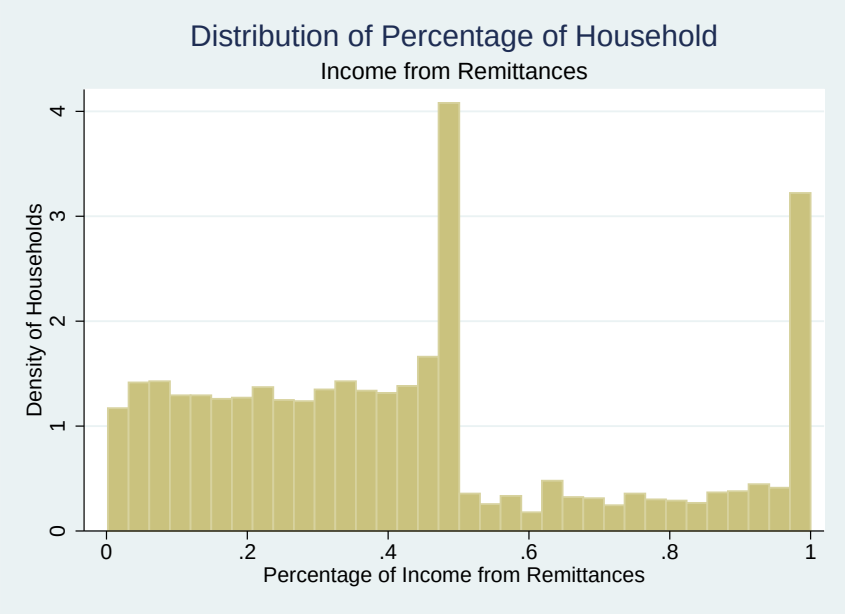

Figure 2: Distribution of percentage of income from remittances for households with school-age children and positive remittance income.

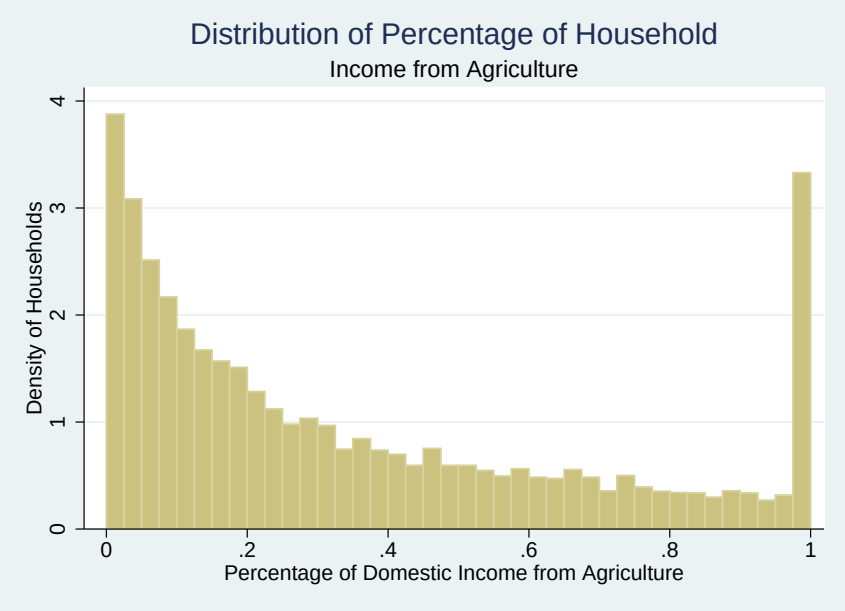

Figure 3: Distribution of percentage of household income from agriculture for households with school-age children and positive agricultural income.

References

Airola, J., and C. Juhn (2005): "Wage Inequality in Post-Reform Mexico," *Institute for the Study of Labor (IZA)*.

Becker, G. S. (1991): *A Treatise on the Family*. Harvard University Press, Cambridge, Masachusetts.

Coronado, R. (2004): "Workers' Remittances to Mexico," *Federal Reserve Bank of Dallas: Business Frontier*.

Davis, B., S. Handa, M. R. Arranz, M. Stampini, and P. Winters (2005): "Agricultural Subsidies, Human Capital Development and Poverty Reduction: Evidence from Rural Mexico," *Submitted to the American Journal of Agricultural Economics*.

Friedman, M. (1957): *A Theory of the Consumption Function*. Princeton University Press, Princeton.

Guerra, R. S. T., J. M. F. Siller, and R. C. Ortiz (2004): "Sistema Educativo de los Estados Unidos Mexicanos principales cifras," *Dirección General de Planeación, Programación y Presupuesto, Secretaría de Educación Pública*, (http://www.sep.gob.mx/work/appsite/princif2003/Princcif2003.pdf).

Hanson, G. (2002): "Emigration and Educational Attainment in Mexico," *NBER Working Paper*.

Lustig, N. (2001): "Life is not Easy: Mexico's Quest for Stability and Growth," *The Journal of Economic Perspectives*, 15(1), 85–106.

Martin, C., and C. Solórzano (2003): "Mass Education, Privatisation, Compensation and Diversification: issues on the future of public education in Mexico," *Compare*, 33(1), 15–30.

Naercio Aquino Menezes-Filho, e. a. (2000): "Adolescents in Latin America and Caribbean: Examining Time Allocation Decisions with Cross-Country Micro Data," *XII Encontro Nacional de Estudos Populacionais*.

OECD (2004): *Migration: the economic context and implications*, vol. 1. OECD Economic Surveys: Mexico 2003, Paris.

Psacharopoulos, G., and Y. C. Ng (1994): "Earnings and Education in Latin America," *Education Economics*, 2(2), 187–208.

Schultz, T. P. (2004): "School subsidies for the poor: evaluating the Mexican Progresa poverty program," *Journal of Development Economics*, 74, 199–250.

Taylor, J. E. (2000): "Do Government Programs "Crowd In" Remittances?," *Inter-American Dialogue and the Tomas Rivera Policy Institute*, January.

Zarate-Hoyos, G. A. (2004): "Consumption and Remittances in Migrant Households: Toward a Productive Use of Remittances," *Contemporary Economic Policy*, 22(4), 555–565.