Remittance Behavior among New U.S. Immigrants

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Abstract

I analyze remittance behavior among new legal immigrants in the US using the 2003 New Immigrant Survey (NIS), a nationally representative survey of immigrants admitted to legal permanent residency in 2003. I use the NIS to address data limitations common to empirical remittance studies, such as low sample sizes, missing information on the donor or recipient and the absence of data which includes immigrants from many countries. Looking first at the distribution of remittances, I find that it is skewed to the right, with a small number of immigrants sending very large amounts. I then analyze the determinants of remittances among new immigrants and estimate remittance-income elasticities. From this analysis, I find evidence that the motivations to remit are not purely altruistic and may include the desire to invest in the home country. I then discuss how future work will re-examine this investment motivation and its relationship to return migration by incorporating later waves of the 2003 NIS to form panel data. Finally, I find that large country differentials in remittance behavior are only partially explained by observable characteristics of the donor, recipient and origin country.

I. Introduction

Remittances from the US—transfers sent by immigrants living within the US to friends and family in their home country— currently play an increasingly important role in the global economy and therefore deserve high priority on a research agenda. Recent estimates show that approximately $96 billion, or about one-third of total international remittances, was sent from the US in 2006.[1] This trend is partly caused by a recent surge in immigration which made the years 2000-2007 the highest 7 year period of immigration and immigration growth in US history.[2] In addition, the countries currently sending the most immigrants are largely those whose emigrants have a high propensity to remit. For example, 60% of the immigrants arriving in the US between 2000 and 2007 came from countries in Latin America or the Caribbean[3] and roughly 75% of immigrants from these countries reported sending remittances on a regular basis in a survey conducted in 2006.[4] Other recent top sending countries include India, China and the Philippines, and we will see that new immigrants from these countries also have a high propensity to remit.

Much of the current remittance literature analyzes the effect of these transfers on the economic development and wealth re-distribution within the home country, (e.g. Chami et al. (2003), Cox and Ureta (2003), Funkhouser (1992), Lowell and De la Garza (2000), Stark and Taylor (1986), Woodruff and Zenteno (2001), and Yang (2004)), as international remittances often constitute a significant portion of GDP for recipient countries. In 2006, for example, remittance flows made up over 10% of GDP for Haiti, Jamaica, El Salvador, Honduras, and the Philippines; remittances to developing countries

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[1] Source: World Bank
[2] Camorata (2007)
[3] Camorata (2007)
[4] Bendixen (2006)

typically exceed official development assistance, are similar in magnitude to foreign direct investment, and are more stable than either of these other flows.[5]

The decision to remit is often modeled with the altruism model of interfamilial transfers (Becker, 1974), in which immigrants are motivated to remit by an interest in their relatives' well-being, transferring more to poorer relatives. Most empirical remittance studies, however, have found evidence that self-interest may at least partially motivate the remittance decision (e.g. Hoddinott, (1994), Lucas and Stark (1985), Ilahi and Jafarey (1999), Osili (2006)). Examples of possible self-interest motivations in the remittance decision include the desire for a larger inheritance or for relatives to visit or call.

Empirical studies of the remittance decision are often impeded by data limitations. Common problems include small sample sizes, missing information on the donor or recipient and the absence of data on remittance behavior over time or across origin country. Among the contributions of this paper are that it uses a large and nationally representative sample of new US immigrants to create a comprehensive new look at the decision to remit. I also use detailed income history available in the NIS to estimate permanent income and remittance-income elasticities. With country fixed effects, I am able to control for country unobservables, such as immigrant self-selection, in my analysis.

I find evidence against altruism as the sole motive for remitting among new immigrants and show that remittances may be used for investment purposes in the home country. I also find that remittance likelihood rises with time in the US and intent to return and that married women are least likely to be remitters. I find that remittance

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[5] Bernanke (2004)

behavior varies greatly by country of nationality, and that these differences are only partially explained by observable characteristics of the immigrant, recipient family, and country. To conclude, I discuss how future work will extend this analysis by encompassing later waves of the 2003 NIS, allowing me to observe return migration and life-cycle movements between remittances and income.

II. Literature Review

After Becker (1974) proposed the pure altruism model of interfamilial transfers, several empirical transfer studies (Altonji et al. (1997), Bernheim et al. (1985), Cox (1987)) showed that family members do not redistribute income to the extent implied by this model. Instead, the results indicated that they are at least partly motivated by self interest. Empirical remittance work has also found evidence that self-interest plays a role in the decision to remit (Hoddinott (1994), Lucas and Stark (1985), Ilahi and Jafarey (1999), Osili (2006)). Transfer theories which combine motives of altruism and self interest are sometimes called theories of "enlightened self-interest."

Below I briefly lay out the comparative statics of the model of pure altruism, which provides simple testable hypotheses. I then discuss various models of self interest. In my empirical analysis, I will first test the main hypothesis of the pure altruism model. If I find evidence against this hypothesis, I will be able to conclude that self-interest motives are at least partially involved in the decision to remit.

Let $\mathbf{R}$ denote remittance level, $\mathbf{R}^+$ denote the set of positive remittances and $\mathbf{Y_{imm}}$ and $\mathbf{Y_{rec}}$ be the permanent incomes of the remittance-sending immigrant and the recipient in the

home country.[6] This altruism framework assumes that immigrants are smoothing agents who make remittance decisions using information about changes in permanent income, rather than transitory income shocks.[7]

Under the altruism hypothesis, the level (conditional on a remittance being sent) and the probability that a remittance is sent rise with the immigrant's income, or:

$$\partial R^+/\partial Y_{imm} > 0 \tag{1}$$

and

$$\partial Pr(R>0)/\partial Y_{imm} > 0, \tag{2}$$

while the level (conditional on a remittance being sent) and likelihood of remittances fall with recipients' income, or:

$$\partial R^+/\partial Y_{rec} < 0 \tag{3}$$

and

$$\partial Pr(R>0)/\partial Y_{rec} < 0 \tag{4}$$

The intuition here is simple. The altruistic immigrant remits in order to decrease income inequality within the family network, so an immigrant with higher income relative to that of the recipient income gives more. Some altruism models include as parameters the "strength" of altruism between the donor and recipient, which reflects that the donor may care more about closing an income gap with close relatives, such as parents, than with distant relatives.

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[6] For a more detailed theoretical discussion of these comparative statics (in the context of inter vivos transfers), see Cox (1987) pp 6-11

[7] This also applies to most of the self-interest motives described below. The one notable exception is the insurance motive, in which remittances are used to help credit-constrained recipients smooth over transitory shocks.

Many self-interest theories have been put forth as alternatives to the pure altruism motive described above. In the "exchange" model of self-interest (Cox, 1987), transfers are made as payments for non-market services provided by the transfer recipient. An immigrant might send a remittance home in "exchange" for services such as childcare, taking care of property in the home country, or time spent with the immigrant in the form of visits. The key difference between the hypotheses of the altruism and exchange models is that, under the exchange model, remittances can rise with recipient income (i.e. wealthier relatives receive more):

$$\partial R^+ / \partial Y_{rec} > 0 \qquad\qquad (5)$$

This would happen if the immigrant's demand for services is relatively inelastic. The relationships between remittance likelihood and recipient income or immigrant income are the same under the exchange and altruism models.

Other self-interest models define remittances as part of a contract between the immigrant and family members in the home country. Family in the home country may decide to send the immigrant abroad so that remittances can act as a form of "insurance" (Stark, 1985) for risky assets (in Stark's paper, cattle during a drought). Alternatively, remittances may be repayment for the family's investments in the immigrant's migration process. The family network might invest in an education for the immigrant if income returns to education are greater in the host country than in the home country, in which case remittances (which rise with the sender's income) become a return on the family's investment (Ilahi and Jafarey, 1999). Additionally, it has been shown that remittances may be payments made by the immigrant to bid for a larger inheritance (Hoddinott, 1994) or a way to signal reliability, enhance reputation, or finance investments in the home

country (Osili, 2006). Empirical work by Robert Suro (2003) of the Pew Hispanic Center on Latino remitters in the US indicates that some remittances are sent to Latin America and the Caribbean in response to political or economic instability or natural disasters, such as Hurricane Mitch in Honduras.

Identifying the motivations behind the remittance decision remains an unfinished task but one that is important to understanding resource sharing among immigrants and their families. Analyses of remittance behavior can help policymakers understand how shocks to immigrant income due to, for example, a lay-off or need-related government assistance, affect remittance flows and the resources of family members in the home country.

III. Data

The New Immigrant Survey 2003

The 2003 NIS[8] is a nationally representative sample of newly admitted legal permanent residents (i.e. "green card" holders, or LPRs) based on electronic administrative records compiled by the US government.[9] I use the Adult sample (defined as those older than 18), which consists of 8,573 observations and includes data on a wide range of topics, including education, language skills, labor force activity, health and health insurance, earnings and wealth, home ownership, migration history and remittances. These immigrants may have just arrived in the US or may have been living

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[8] Jasso, Guillermina, Douglas S. Massey, Mark R. Rosenzweig and James P. Smith. "The New Immigrant Survey 2003 Round 1 (NIS-2003-1) Public Release Data." March 2006. Retrieved August 2008. Funded by NIH HD33843, NSF, USCIS, ASPE & Pew. The data collection was performed by professional survey staff from the National Opinion Research Center (NORC). More information about the survey and research team, as well as documentation and data can be found here: http://nis.princeton.edu.
9 Specifically, the records of immigrants admitted to LPR status were compiled by the INS (Immigration and Naturalization Service) and are now compiled by its successor agencies, the USCIS (US Citizenship and Immigration Services) and the OIS (Office of Immigration Statistics).

in the US for some time on a temporary nonimmigrant visa or with undocumented status.[10]

The sample consists of immigrants (respondents) admitted to LPR status from May-November 2003. Surveys were conducted as soon as possible after admission. Immigrants in the sampling frame were contacted using the address to which they had requested the green card be mailed. The 2003 sample represents the first interview of the first full cohort (a pilot was conducted in 1996), as the NIS will be a multi-cohort longitudinal study.[11] A second interview of the 2003 cohort was conducted in 2007 and data from this interview will be released in late 2009.

The sampling frame for the 2003 NIS is based on visa types. Admission to LPR status is granted to immigrants who meet certain eligibility criteria (such as spouses of a US citizen and certain types of workers or refugees) and these immigrants are called "principals." The US government then also grants immigrant visas to spouses and minor children "accompanying, or following to join" the principals. The sampling frame for the 2003 NIS consists of "principals" and accompanying spouses and is based on four strata:

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[10] Here is an unweighted tabulation of the adult sample by visa type with average years since first arrival in the US to live

Categories of Visas in 2003 NIS Sample	Freq	Percent	Avg Yrs Since Arrival
Other	786	9	3.2
Spouse of US Citizen	1,428	17	5.5
Spouse of LPR	209	2	7.6
Parent of US Citizen	995	12	4.8
Child of US Citizen	283	3	2.7
Family Fourth Preference	533	6	1.4
Employment Preferences	1,673	20	5.2
Diversity	1,451	17	1.6
Refugee, Asylees, Parolees	554	6	6.5
Legalization	661	8	15.4
Total	8,573	100	

[11] For more information on the sample construction, see Jasso et al (forthcoming) and http://nis.princeton.edu/overview.html

spouses of US citizens (undersampled), employment principals (oversampled), diversity[12] principals (oversampled) and other immigrants. The NIS provides are sample weights to account for sample design. The sample response rate is 68.6%.[13]

As described above, the survey forms a very thorough review of the immigrant's life before and after migration. Occupation and earnings data, for example, is available at four different stages of the immigrant's life—around age 16, immediately before migration, immediately after migration and at the time of the interview. Much of the survey was also given to available spouses living in the same household as the respondent, yielding detailed information on 4,915 spouses. In order to deal with language barriers, interviews were conducted in respondents' preferred languages.

I compared the NIS sample to the 2003 US foreign born population using the American Community Survey (ACS) and found several differences.[14] The weighted NIS sample is 56% women and 74% are married or living with a partner, whereas 50% of the ACS sample is female and 63% are married.[15] The ACS sample of foreign born is also older and arrived in the US earlier. The mean age in the NIS data for men and women is 39, whereas it is 42 for men and 44 women in the ACS. Immigrants in the NIS arrived an average (median) of 6 (3) years ago whereas immigrants in the ACS sample arrived an average (median) of 21(18) years ago. While the sending countries between the two are

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[12] Diversity principals are winners of an annual green card lottery which is open to people from countries with low rates of immigration to the United States.

[13] Independent analysis on the 2003 NIS by Hersch (2008) concludes that nonresponse is does not appear to be more pronounced in some groups in the 2003 NIS than others.

[14] I used an approximately 1 in 236 ACS sample, found here: http://usa.ipums.org. This sample includes undocumented immigrants.

[15] Data compiled by the Department of Homeland Security also shows that 2003 LPR recipients are younger and more likely to be female and married than the native population of the US. See Reytina (2005). This is because the largest proportion of LPR visas go to spouses of US citizens, and the majority of these visas go to women (as shown in the NIS data). In addition, the majority of immigrants receiving green cards as spouses of LPRs, parents of US Citizens and through employment are women in the NIS data.

largely similar (the five most frequent in the NIS are Mexico (17%), India (7%), El

Salvador (6%), Philippines (5%), and China (5%)),[16] the percentages of ACS immigrants

from Mexico (28%) and El Salvador (3%) are somewhat different. Finally, the foreign

born population from the ACS have higher labor income (median and mean of $23,118

and $32,882 compared to $20,280 and $30,708), which may reflect the fact that they have

had more time to assimilate in the US.

The Remittance Measure: Construction and Univariate Analysis

Under the definition currently in use by the International Monetary Fund (IMF),

remittances are international transfers of funds sent by migrant workers from the country

in which they are working to people (typically family members) in the country from

which they came.[17] I used this definition to create the remittance measure used in this

analysis.

In a section of the NIS questionnaire on transfers, the most "financially

knowledgeable" of the respondent and his or her spouse are asked about money transfers

from either the respondent or the spouse to relatives and friends during the last 12

months.[18] I counted a transfer to friends and relatives of the respondent as a remittance if

the recipient lives in the respondent's country of nationality. Specifically, transfers to

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[16] The public use files do not release country of nationality for approximately 30% of the sample. Instead, country of nationality is given one of 9 continents, such as "Europe and Central Asia," "Latin America and the Carribean" or "African Sub-Saharan." There are 22 country categories.
[17] see International Monetary Fund (1993) p. 75
[18] The survey question pertaining to transfers given to a certain relative, is the following, or a slight variant of the following: *During the last twelve months, did you or your spouse give any financial assistance (such as gifts, transfers, bequests, or loans) to your [relative].*

parents, spouses, siblings, children, "other relatives," and "other friends" of the respondent were counted.[19]

Some difficulty in measuring the remittances arises because about 1/5 of the immigrants who indicated that they had sent a remittance replied that they were not sure or refused to tell how much they had sent. This may be partially due to the question structure which asks for an amount and then a regular frequency (biweekly, monthly, biannually, etc.) with which this amount was sent over the past year. This does not allow for variation in the amounts sent, and many respondents wrote in alternate frequencies and amounts such as "Under 500 whenever she needs it," or simply checked "do not know," which made it impossible to measure how much had been sent in these cases.

Finally, it is important to note that many remittance and intergenerational transfer studies (Osili, 2006; Stark, 1985; Rosenzweig and Wolpin, 1993; Altonji et al, 1997) use datasets which match potential transfer senders and recipients. In the NIS data, it may be that no remittance is recorded because the immigrant does not have friends or family in their country of origin, possibly because they have migrated themselves. I therefore restrict the sample to immigrants who have a "close relative" (parent, a spouse, or a child of any age)[20] currently living in the country of origin. This turns out to be 73% of the NIS sample (72%, weighted). The fact that this is a relatively large percentage probably

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[19] There is some difficulty ascertaining whether or not certain recipients live in the country of origin. It is impossible to determine the current country of the respondent's siblings as well as the "other relatives" and "other friends," although it is possible to tell if the friends and relatives are outside the US. In addition, when answering how much money was transferred to young children, the respondent is not asked to identify the children. I counted all remittances to siblings if the respondent's parents are currently living outside the country and all remittances to friends and relatives living outside the US. As for young children, I recorded a remittance if any of the young children live in the country of nationality, and assigned an amount equal to the total remittances sent to young children multiplied by the fraction of young children living outside the US. As such, remittance frequency may be a bit overstated.

[20] NIS only provides country of residence for children, spouses, and parents, as opposed to siblings, or other relatives and friends.

reflects that the majority of the sample arrived in the US very recently[21] and therefore

may still have strong ties to their home countries.[22]

Table 1 shows descriptive statistics for remittance amount and frequency in the

NIS sample as well as the restricted sample. 11.7% of the whole sample sent a

remittance over the preceding 12 months, compared with 15.4% for the restricted sample.

Among those who sent remittances, the average amount sent over the past year is

$2,903[23] (median $1,200) for the whole sample and $2,950 (median $1,200) for the

restricted sample. Remittances are therefore skewed to the right, with the mean more than

double the median in both samples. However, the values higher than the median are quite

large compare with the rest of the sample. The remittances above the 75th percentile in

comprise nearly ¾ the sum of all remittances sent. Evidently, the majority of immigrants

are sending smaller amounts but some are sending very large amounts.

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[21] Around 2/3 of the sample arrived in the US for the first time to live within the last 5 years
[22] Here I compare averages of important variables from the NIS sample and the restricted sample, which shows that the samples are similar.

	NIS Sample	Restricted Sample
Age	38	39
Female	55%	55%
Married	77%	82%
Median Labor Income	19659.51	20280.01
Time Since Entry		
Average	6	6
Median	3	3
Visa		
% Legalization	8%	8%
% Family	57%	60%
%Employment	10%	11%
% Mexican	15%	16%
% Salvadoran	6%	6%

[23] All dollar amounts are in 2003dollars.

I then compared remittance frequency and amount between the NIS sample of

Latino remitters to a 2004 poll of Latino remitters in the US conducted by Bendixen and

Associates.[24] I found that the average amount sent by Latino remitters in the two samples

is similar ($2,900 over the last year in the NIS vs. $2,800 on a yearly basis from the

Bendixen survey). The average frequency is not similar, however; as 61% of Latino

immigrants in the Bendixen survey remit on a yearly basis, whereas only 13% of NIS

Latinos remitted over the last year.

Estimates of Frequency and Amount by Recipient[25]

As can be seen in Figure 1, 9.5% of immigrants in the restricted sample sent

remittances to parents, 2.4% remitted to young children, 1.8% remitted to adult children,

1.6% remitted to siblings, 1.6% remitted to other family and <1% remitted to other

friends during the past 12 months. Figure 1 also shows average non-zero remittance

amounts by recipient. On average, immigrants in this sample sent back $2,181 to parents,

$3,499 to adult children, $3,758 to young children, and $1,921 to other relatives over the

past year.

Estimates of Frequency and Amount by Region of origin

Remittance frequency and amount sent over the preceeding 12 months differs

greatly by country of origin.[26] Immigrants from African Sub-Saharan are most likely to

send in the restricted sample, at 24%, followed by those from Latin America and the

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[24] A powerpoint document with summary statistics from this survey can be found on the website of the Inter-American Development Bank here
http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=820729
[25] Data on remittance amount (as opposed to frequency) sent to siblings of the respondent and spouse is currently missing in the NIS data files due to an error. This data will be re-released soon and the analysis in this paper will subsequently be updated.
[26] Full calculations available upon request

Caribbean (17%), East, South, and Pacific Asia (14%), the Middle East and North Africa (12%), Europe and Central Asia (10%), and Other North America (9%). By country, immigrants from Guatemala send with the highest frequency (35%), which is more than double the sample frequency (15%), followed by those from El Salvador (32%), Nigeria (29%), and the Dominican Republic (28%). The least frequent senders are Poland, Korea, United Kingdom, and Canada.

Average remittance amount also shows heterogeneity by country of origin, although median remittances by region do not vary significantly.[27] Counting those regions with over 50 remittance observations, the highest mean amount is from immigrants from African Sub Saharan ($5,201), followed by those from East Asia, South Asia and the Pacific ($3,447) and Latin America and the Caribbean ($2,369).

Remittances as a Percentage of Income

I created four measures of annual income: permanent labor income of the head of household and immigrant, current labor income of the immigrant and family income (includes income from labor as well as assets). These measures were created using current annual earnings, annual earnings immediately post migration, and annual asset income.[28] The questions on occupation, wage and salary history in Sections B and C first determine if the respondent is doing/has done any work for pay, and then establish a frequency of payment. The earnings measure was created either by using annual reported earnings or by combining hours and weeks worked per year with hourly wage. It includes self employment earnings and earnings at a second job.

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[27] Counting those regions with more than 50 remittance observations, the range for median remittances is $1,200 to $1,500.

[28] Assets include additional homes and real estate, checkings and savings accounts and transportation equipment.

It is important to estimate permanent income, as the use of current income in transfer and remittance studies is problematic in two ways. First, it is assumed that immigrants exhibit smoothing behavior and make remittance decision based on permanent, rather than current, income. Second, current income of the donor and recipient may be endogenous to remittance behavior and this is impossible to control for without knowledge of past remittance behavior.

To create a measure of current labor income of the immigrant, I took the log of current earnings of respondent. For family income, I created the sum of non-missing respondent earnings, spouse earnings, and asset income. As for estimating permanent labor income, I use a modification of the method used in Altonji et al. (1997). They use panel data on salaries from a mostly native sample of the US population, and I adapt their specification to the NIS restricted sample by adding variables to account for the process of assimilation. There exists a large body of economic literature on the effect of assimilation on immigrant wages in the host country, showing that wages, especially right after the immigrant arrives (which is relevant in this sample of new LPRs), are biased downward.[29] Because I combined current earnings with those measured immediately after arrival, it was important to account for the bias in this first wage when estimating permanent income.

After creating panel data from the two head of household[30] or immigrant earnings observations, I ran gender-specific regressions of earnings in log form on age in cubic

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[29] See Borjas (1994). In the NIS data, large gains in earnings are made in the first five years since first arrival in the US to live.

[30] I defined the head of household as the respondent if male, or of the spouse if the respondent is female. Exceptions to this rule are when the female respondent has non missing or non zero earnings and their male spouse have a zero or missing earnings measure. In cases in which the head of household have zero earnings, I created variables which indicate labor force status (retired, homemaker, disabled or unemployed).

form, marriage dummies and number of children in the household as well as number of

years in the US and country of origin and then estimated residuals. I then predicted the

wage for a 40 year person who is married and has one child (the median in the dataset)

and arrived in the US five years ago.[31] I then added a weighted average of the

individual's two residuals from the intial regression to this. As such, this measure of

permanent income functions as a kind of time-adjusted income average.

A quick look at Table 3 shows the difference between the average permanent

income (higher) and current income (lower), which reflects the fact that roughly 2/3 of

the sample entered the US to live for the first time within the last 5 years and therefore

may have a current wage which is biased downward due to the effects of assimilation.

The median head of household annual permanent labor income is calculated to be

$32,016, with 25th percentile at $17,923 and 75th percentile at $45,813. In comparison, a

foreign born man between the ages of 38-42 who is married and has been in the country

between 5 and 10 years has median annual earnings of $32,446 in the 2003 ACS, with the

25th percentile at $18,251 and 75th percentile at $60,837.

Table 2 contains the ratio of remittances sent over the past year to head of

household permanent income, the immigrant's current income, and GDP per capita in the

home country (using the restricted sample). The average immigrant in this sample sent

less than 5% of both measures of annual income in remittances each year. Among those

who sent remittances, the mean ratio to permanent and current income is 0.10 and 0.16,

respectively, while the medians are less than half the means, at 0.04 and 0.07

respectively. The distribution of these ratios is skewed to the right, like the remittance

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[31] Because it is possible that the native born spouse is the head of household (in which case he or she only has one wage observation—current), I put in a time since entry indicator of "all years" for these people. There were relatively few native born head of household spouses.

distribution, showing that while most immigrants give a low amount of their income, some give much more, with the 90th percentile giving 0.38 of their permanent income, or 0.80 of their current income. The ratio of remittances to GDP in the home country is of course much higher—the overall mean (median) is 0.35 (0) vs. 2.42 (0.57) in the restricted sample vs. remitters only.

Profile of A remitter

Table 3 shows summary statistics for the estimation sample as well as for remitters and non-remitters separately. A quick comparison shows some important differences. Remitters in the 2003 NIS are much less likely to be female overall, but particularly female and married, and much more likely to be male and married. This most likely reflects differences in earning and labor force participation (31% of women immigrants are not in the labor force compared to 5% of male immigrants). Remitters have been in the country longer; the average remitter arrived 2 years before the average non-remitter, which probably reflects the effects of assimilation on earnings, but may also reflect a cohort effect.[32] Additionally, immigrants who remit are more likely (16% vs. 12%) to intend to return home. In terms of income, remitters earn more than non-remitters, and are less likely to be unemployed or not in the labor force. They are much more likely (18% vs. 11%) to hold assets in the home country.[33] Finally, remitters are more likely to have families that are poorer, both in relative (to their countrymen) and absolute (the level of GDP) terms.

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[32] In particular, the difference between time of entry for remitters and non-remitters diminishes to 1.4 if Salvadorans are excluded. Salvadorans have one of the highest propensities to remit and average amount remitted in the sample and arrived on average 13 and at the median 14 years ago (s.d. 5 yrs). The vast majority of Salvadorans (around 80%) received their green cards through amnesty.

[33] Further analysis shows that the majority of these assets are real estate, as opposed to savings or checkings accounts or transportation equipment.

IV. The Model

Given the discussion of theoretical models of remittance behavior above, it is clear

that it is important to use measures of the economic resources of the immigrants and

relatives to model remittance behavior. I use as measures of the economic resources of

the immigrant: income, employment status, education and an indicator for whether the

immigrant holds assets in the home country. As for economic resources of the relatives, I

use income level of the immigrant's family,[34] whether or not they live in a rural area,

GDP per capita in the home country,[35] unemployment rate in the country of origin and

the father's total years of education.

I also use as controls variables relating to the immigrant's migration patterns. These

variables include years since first entry to the US to live, intent to return, number of re-

entries into the home country to live and country of nationality indicators. As mentioned

above, theoretical altruism models normally include a measure of the altruistic bond

between donor and recipient, in order to differentiate between strong relationships in the

family, such as parent-child, and weaker relationships, such as aunt-child. Some

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[34] With regards to income of the family in the home country, the immigrant is asked:

> *Now I'd like to ask you some questions about when you were a child. Thinking about the time when you were 16 years old, compared with families in the country where you grew up, would you say your family income during that time was far below average, below average, average, above average, or far above average?*

The fact that this is given for the time period when the immigrant was 16 means it is a good indicator for the parent's permanent income (income measure at the time of the survey would be biased downward since most parents are past prime earning age). There is no way to measure the income of the other recipients (such as siblings), however, so this must serve proxy for the income of other remittance recipients. In addition, the fact that this is measured at the time the immigrant was 16 solves usual problems of endogeneity of recipient labor supply and income in transfer models. The question pertaining to whether or not the family lived in a rural area is also asked for the time when the immigrant was 16.

[35] I include GDP in US dollars using official exchange rate (OER) and purchasing power parity (PPP) estimates separately. Although PPP estimates are normally preferred because they give a consistent measure of the "quality of life" between countries, it is necessary to use OER rates because the transfer amount (and sender income) is in current US dollars. I include the unemployment rate along with the OER help control for "quality of life" between countries.

variables, such as distance and time separation may weaken the strength of these bonds, and so it is important to include them in the model.

Finally, I include various demographic controls of the immigrant and relatives, including age, gender and marital status interacted, total number of children in the household, and number of siblings of the immigrant.

To model the likelihood of remitting, I estimated the following specification: Let E denote the event in which a remittance takes place, X_{imm} denote immigrant characteristics and X_{rel} denote relatives' characteristics.

$$\Pr(E) = \Phi(\beta_0 + \beta_1 X_{imm} + \beta_2 X_{rel} + \varepsilon) \tag{6}$$

where Φ denotes the cumulative normal distribution function. This is the probit model.

Modeling remittance level is trickier. For one, about 85% of the distribution is at 0 (i.e. no remittance sent) and using OLS to estimate remittance amount on the whole sample would create coefficient estimates which are biased downward and inconsistent.[36] Using the Tobit[37] model creates unbiased coefficient estimates, but constrains regressors to have the same effect on the likelihood and level and this may be unreasonable. Hoddinott (1994) notes that distance to one's home country, for example, may reduce the likelihood of a remittance but not the amount.[38] In addition, under any motive besides pure altruism, remittance amount may be nondecreasing in recipient income while remittance likelihood would be decreasing in recipient income. Finally, I want to check

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[36] Specifically, this is because the truncated distribution causes the mean of the estimated error term (call this ê), to be different from 0, which violates the assumption that E(e) = 0.
[37] Introduced by Tobin (1958)
[38] This is particularly plausible because many remittances are sent by way of friends and relatives traveling to the home country. In 2004, around 11% of Latino immigrants sent remittances via "people travelling" (Bendixen, 2004).

the prediction of the altruism model that remittance amount, conditional on remitting, is decreasing in recipient income (see Eqn 1), and for this, I need to model non-zero remittances.

I model the following equation:

$$\ln(R) = \beta_0 + \beta_1 X_{imm} + \beta_2 X_{rel} + \varepsilon \mid R > 0 \tag{7}$$

where R is the remittance amount

If remittances are non-decreasing in recipient income, this would provide evidence against a pure altruism motive (see Eqn. 1). If remittances are increasing in recipient income, this could indicate an exchange motivation (see Eqn. 5).

Using OLS on the sample of remitters to estimate Eqn. (7) may create biased coefficient estimates due to sample selection. Sample selection bias arises if there is nonzero correlation between the error terms in the likelihood and level equations (i.e. if there is an unobserved immigrant characteristic, such as "diligence"—Hoddinott (1994) provides this example—which affects the level and likelihood of remitting). Using Heckman's (1979) two-step method, one can look for sample selection bias by estimating the correlation and testing whether it is different from zero using a t-test.

V. Results

Estimation results for the probit are shown in Tables 4; marginal effects evaluated at the mean of the regressors are reported. As for the level regressions, I first estimated both the two step and maximum likelihood Heckman sample selection models and found

no evidence of bias due to sample selection. [39] In the two step model, the effect of the

selection term was not precisely estimated and in the maximum-likelihood model, I was

unable to reject the hypothesis that $\rho = 0$. I then estimated OLS coefficients on the

sample of remitters and found very little difference in the OLS and Heckman coefficients,

which also indicates a lack of sample selection bias in the OLS model.

Specifications in both tables vary by regressors included. In Table 4,

specifications (1)-(4) include as the income measure (in this order): permanent income of

the head of household, permanent income of the immigrant, current income, and family

income. Specification (5) repeats specification (1) with the addition of country of

nationality indicators and the subtraction of the GDP indicator. As for Table 5,

specifications (1)-(3) use the official exchange rate GDP, and (4)-(6) use PPP GDP.

Specifications (2) and (5) in Table 5 add time since entry. Effects on income may be

sensitive to the presence of time since entry if it picks up a cohort effect and cohorts have

different income levels. Specifications (3) and (6) in Table 5 add country indicators and

take away the GDP control.

Below I discuss the results in Tables 4 and 5 by regressor group.[40]

Economic Resources of the Immigrant

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[39] I tried two different selection equations: using the log of distance and an indicator for being from Latin America as variables which might affect the likelihood but not level of remittances. Since remittances are sometimes transmitted through informal channels (i.e. relatives or friends traveling to the home country), proximity may enable the act of remitting while not affecting the amount remitted. As for the Latin America dummy, I find that the likelihood of remitting is much higher among immigrants from countries in Latin America, whereas there is negligible difference in amount remitted. This may be due to behavioral differences, differences in cultural norms, or differences in immigrant self-selection.

[40] The specifications shown exclude some variables listed as covariates in Section IV. In preliminary analysis, I found that the following have negligible effects and eliminated them from the specification: education, father's education and number of re-entries to the home country to live.

For new immigrants, an increase in income means an increase in the likelihood of remitting and the amount sent. This is consistent with the predictions of the altruism model (see Eqns. 1,2) as well as various self-interest model, such as exchange. Table 4 shows that the effect of income on the likelihood of remitting varies a bit by specification; a 1% increase in income increases the likelihood of remitting somewhere in between 1.4 and 2.1 percentage points, which is about 1/10 of the sample frequency. In addition, the effect of being unemployed or not in the labor force is negative and around 4-7 and 9-10 percentage points, respectively.

The OLS results from Table 5 show that the effect of permanent labor income is consistently estimated at about 0.4, although this effect falls to 0.3 when country indicators are added, meaning that a 1% increase in income increases remittance amount by 0.3-0.4% for the average immigrant in the sample who remits. Table 7 shows remittance-income elasticities by type of income. In comparison to permanent income elasticity, the current income elasticity is lower (~0.1, for the immigrant as well as the head of household).

Holding assets (virtually all of which are real estate) in the home country has a very large, positive and significant effect on the likelihood (~0.1, or ½ the sample frequency) and level (~10-30% increase) of remitting, conditional on remitting. This may indicate that for some new immigrants, remittances are a means of investing in the home country. Recent studies by Dustmann and Kirchkamp (2002) and Osili (2006) provide evidence that remittances are used to finance investments in the country of origin in the form of land and housing acquisition.

There are several plausible "investment" scenarios, which include motives of altruism, self-interest, or a combination. Immigrants may be investing in the home country to maintain ties and increase stature, particularly if they intend to return, [41] or to provide for their family members, possibly in the form of housing. Alternatively, it could be that immigrants are sending money to pay relatives in exchange for managing the sale of real estate they currently own in the home country, since the percentage holding assets in the home country drops with time since entry (in the first year, 20%; in the second 16%; in the third 10%),.[42] This could also reflect, however, the fact that those who initially invested intended to return home and do so within the first couple of years.[43] Future research which will incorporate later waves of the 2003 NIS to form panel data will re-examine this investment motive by looking at the relationship between return migration[44] and remittances.

Economic Resources of Relatives in the Home Country

The effects of both GDP and family income on remittance level (shown in Table 5) provide evidence against the model of pure altruism, indicating that self-interest is at least partially involved in the remittance decision for new immigrants. It may be that some remittances are sent back for "self-interest" investment purposes, as described

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[41] This "prestige" motive is put forth in Lucas and Stark (1985). See pg 904
[42] While, it is plausible that transfers are for mortgage payments on home country real estate, it is not likely those payments are included in the remittance measure for two reasons. First, the interviewees are specifically asked about mortgage payments in the previous section of the questionnaire, and, second, the wording of the remittance question is such that the transfer is supposed to be "financial assistance" for the recipient.
[43] Osili (2006) finds evidence that less skilled immigrants (who have lower future expected income) are more likely to invest in the home country, perhaps out of a precautionary savings motive in case they decide to return home.
44 Return migration is a reality for many LPRs. Jasso and Rosenzweig (1982) estimate that 30% of LPRs return over the first 10 years

above. More specifically, we can see that remittance level is nondecreasing[45] in recipient income, whereas under the altruism hypothesis, remittance level should fall with recipient income (as shown in Eqn. 3). The effect of a 1% increase in GDP raises remittance level by somewhere between 0.02-0.2%. In addition, immigrants with family whose income is "Above Average" or "Far Above Average" send about 50-90% and 60-130% (respectively) more than those whose families have "Average" incomes. Interestingly, immigrants with family whose income is "Below Average" or "Far Below Average" also send more than those with family whose income is "Average," although only about 10% and 40-50% (respectively) more. Thus, the results show a kind of U-shape relationship between relative family income and remittance amount.

In the probit regressions shown in Table 4, both GDP and relative income of the immigrant's family have a negative effect (as is predicted by the altruism model in Eqn. (4) as well as the exchange model). A 1% increase in GDP lowers remittance likelihood by about 0.06, which is roughly 1/3 of the sample frequency. The effect on remittance likelihood of the family having "Below Average" or "Far Below Average" income, compared to "Average" income, is positive and significant, whereas the effect of the family having income "Above Average" or "Far Above Average" is negative.[46] The effect of the unemployment rate in the home country and whether or not the immigrant's family lived in a rural area (two measures of poverty) when he or she was 16 are both positive.

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[45] Recall from (5) that under the exchange model remittance level increases in recipient income under certain conditions

[46] It is possible that that family income could serve as a proxy for unobserved characteristics of the migrant's income process, such as skill level and would therefore bias the coefficient on migrant income. I find no evidence of this bias when I exclude family income from the regression equations.

Demographics

Table 4 shows that the effect of being a married woman (as opposed to a married man), when significant, drops the likelihood of remitting about 4-6 percentage points for the average immigrant in the estimation sample, which ranges from about 1/5 to 1/3 of the sample frequency. The effects of being a single man or woman on remittance likelihood are positive (and larger for single men) with regards to being a married man, although these effects are not significant. The coefficients from the OLS regressions presented in Table 5 reveal a similar pattern, although they are not estimated precisely.

It is possible that the married immigrants send less to their families because of obligations to their spouse or spouse's relatives.[47] The fact that single or married women send less than their male counterparts may indicate that the role of the remitter is partly defined along gender lines. Besides these effects, the effect of an extra young child in the immigrant's household (which indicates constraints on the immigrant's income), an extra sibling, or an extra year of age are very small and not precisely estimated.[48]

Migration Variables

Tables 4 and 5 also show the effects on remittance behavior of the migration history and future migration plans of new immigrants. Intent to return to the home country to live, for example, has a large, positive effect on both remittance level and likelihood. In the probit regressions, the effect is 6 to 9 percentage points, which is around 1/3 to ½ of the sample frequency, and in the OLS regressions (where the effect is significant at the 15% level) intent to return raises remittance amount by about 20-34%,

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[47] If the majority of married immigrants' spouses were living abroad, one might expect them to send more on average, than single immigrants. In this sample, however, only 4% of the sample have a spouse in the home country.

[48] I tried entering various nonlinear forms of age into the equation and found no remarkable results.

holding all else equal.[49] As mentioned above, it may be that immigrants who intend to return send more to maintain ties or increase stature in their home country. Funkhouser (1995) put forth an altruistic model of remittance behavior in which remittances rise with intent to return because immigrants who want to return have stronger altruistic bonds with their families.

Time since first entry to live in the US (entered non-linearly as five indicators) also has a strong effect on both the likelihood and level of remittances. The effect on likelihood is positive for the average immigrant, while the effect on remittance level is initially positive and then falls after about year 10. While remitting frequency may increase as the new immigrant becomes assimilated (gets a job, finds a permanent residence, determines the best method through which to send remittances), one might expect that as time passes it would decrease, especially if altruistic bonds weaken over time.[50] One possible explanation is that the web of dependents in the home country increases with time. Alternatively, this result may be evidence of immigrant selection over time, in that if only successful immigrants eventually stay in the US, then those who have been here longer will send back more because they are more prosperous.[51]

I also considered that this effect might have to do with the fact that immigrants transferring to LPR status through legalization (amnesty) have been in the US for much

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[49] When time since entry is added to the equations the effects on intent to return fall, possibly because the two are highly correlated as those who intend to return leave as time goes by, or change their minds.
[50] In separate analysis, I determined that yearly earnings rise steeply with time since entry until the fifth year, after which point the rise is much flatter. This indicates that the affects of assimilation might be more muted after year 5. In the results in Table 4, we can see that the effect of additional years is significant and positive at year 16. Additionally, a variant of the altruism model which incorporates the idea that altruism weakens over time in the host country is described in Rapoport and Docquier (2005) on p. 23
[51] As an additional test, I determined that time since entry is not picking up the effects of age or parental age in a nonlinear form by adding these variables into the probit regressions. An immigrant might send more frequently to aged parents because of increased dependency or in an effort to bid for inheritance.

longer than others in the sample and also have a much higher rate of remitting.[52] When I control for visa type or exclude amnesty recipients from the regression sample, however, the effect of time since entry in the probit regressions from Table 4 is still positive (even past year 16), although the magnitude of this effect is greatly reduced.[53] It appears that the positive effect of time since entry on remittance frequency may be partly but not solely due to differences in remittance behavior by visa types.

Empirical evidence on the effect on remittance behavior of time spent in the host country is mixed. Rodriguez (1995) finds that remittances (likelihood and level) rise and then fall with years spent abroad for Filipino immigrants. Suro (2003), on the other hand, finds evidence of long-standing remittance flows from US immigrants to Honduras, Guatemala and El Salvador. Likewise, Funkhouser (1995) found that remittances from the US to close family members in El Salvador reacted positively to years spent in the US but remittances to close family members in Nicaragua were negatively affected by time.

Lastly, in Tables 6a and 6b, we can see the country effects from regressions (5)-(6) and (10)-(11) in Tables 4-5 (with regards to the baseline category: Mexico). There are very strong country-specific effects on remittance likelihood and level. For example,

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[52] Here is a table which gives average years since entry and remittance frequency by visa type

Categories of Visas in 2003 NIS Sample	Freq	Percent	Avg. Yrs Since Entry	Remit Frequency
Legalization (Amnesty)	661	8	15.4	0.33
Refugee, Asylees, Parolees	554	6	6.5	0.22
Spouse of LPR	209	2	7.6	0.17
Other	786	9	3.2	0.15
Spouse of US Citizen	1,428	17	5.5	0.14
Employment Preferences	1,673	20	5.2	0.13
Diversity	1,451	17	1.6	0.13
Family Fourth Preference	533	6	1.4	0.1
Parent of US Citizen	995	12	4.8	0.07
Child of US Citizen	283	3	2.7	0.03
Total	8,573	100		

Avg. Yrs Since Entry and Remit Frequency are weighted.
[53] Results available on request

the effect of being from the Dominican Republic, El Salvador, Guatemala, Nigeria or the Philippines is an increase of 0.1-0.2 in the likelihood of sending a remittance for the average immigrant, which is around the magnitude of the sample frequency, and represents some of the largest marginal effects in the regression.

Comparing 6a and 6b, it is clear, however, that country effects on remittance likelihood and level do not necessarily have the same sign. For example, the effect on level of being from El Salvador or Nigeria is negative. There are large, positive and precise effects of being from Canada, China, India, the Philippines, or Poland on remittance level. The effect of being from China (vs. Mexico), for example, increases remittance amount by 81%.

These effects may be caused by country-specific unobservables (such as cultural expectations) which inform remittance behavior. Funkhouser (1995) compared a sample of Nicaraguans and Salvadorans in the US and found that striking differences in remittance behavior between the two samples could not be explained by the observable characteristics of the migrant or the recipient household. He concluded instead that behavioral differences and differences in self selection of immigrants explained these differences.

Determinants of Remittance Differentials by Country

The coefficients discussed above represent large, unexplained remittance differentials by country, and in this section, I want to see how effective a group of variables which capture the differences between countries will be in explaining these differentials. I chose country-specific variables which give information about the

economy of the country, the quality of life of its inhabitants, and the ease of remitting to this country. The variables are listed below.

Variable	Source
Log GDP, 2003	CIA World Factbook
GDP growth 1970-2003	Penn World Tables
Openness, 1965-1990	Sachs & Warner (0 = closed, 1 = open to trade)
Infant Mortality Rate, 2003	CIA World Factbook
Log(Distance) between countries	Centre D'Etudes Prospectives Et D'Informations Internationales

I use the GLS estimator outlined in Borjas (1987), Borjas and Sueyoshi (1994), and Aaronson, Barrow and Sanders (2007) to evaluate the impact of the variables above on the remittance behavior differentials by country, which are given by the 21 coefficients on the country indicators in regressions (1) and (2) in Tables 4 and 5 (cols. (1) in both tables). The GLS estimator is needed to account for the fact that that the error in the following OLS regression (where $\hat{c}_j$ is the vector of country coefficients, Z is the country characteristics listed above, and j indexes country) is heteroskedastic:[54]

$$\hat{c}_j = \gamma Z + u_j, \tag{8}$$

The variance of this error, u_j, will be given by $E(u_j^2) = \sigma_j^2 + \varphi^2$, where σ_j^2 is the variance of the coefficients from regressions (1)[55] and (2), and φ^2 is the homoskedastic error from the following regression:

$$c_j = \gamma Z + u_j . \tag{9}$$

Using estimates of σ_j^2 from estimation of (1) and (2) combined with that of u_j from estimation of (3), we can calculate φ^2, which is then used to estimate (3) using GLS. The results are shown in Tables 8 and 9.

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[54] In order to simplify the calculations for the GLS estimator, I re-estimated the likelihood regression as an OLS linear probability model.

[55] Estimated as an OLS linear probability model instead of a probit, as explained in the last footnote.

Looking at Tables 8 and 9, one can see that remittance frequency differentials are much more effectively explained by the country-specific variables than the remittance amount differentials. Whereas the country-specific variables explain up to 55% of the variation in country effects from the frequency regression, they explain up to only 20% of the variation in the country effects from amount regression. The fact that a significant amount of the large remittance level differentials is unexplained may indicate that country unobservables, partially determine remittance behavior.

As for the determinants of remittance differentials, Tables 8 and 9 show that "openness" explains a large amount of the variation. This variable has a strong negative effect, meaning that a country more open to trade is associated with a smaller country effect on remittance behavior. A higher infant mortality rate is associated with a larger country effect, while a bigger distance is associated with a smaller country effect. For remittance level, higher GDP growth is associated with a larger country effect.

IV. Directions for future research

In the future, I will extend the research presented in this paper by incorporating future waves of the 2003 NIS into my analysis. This will enable me to observe return migration and the joint life-cycle movements between remittances and income. I will examine the relationship between investment in the home country and return migration. I will be able to measure more accurately the permanent income, which is affected by assimilation in the first wave. Finally, as the NIS releases data which is currently classified, such as more detailed country of nationality indicators, it will be possible to re-

examine the results found here, including the importance of country-specific effects on remittance behavior.

V. Conclusions

Using a nationally representative and detailed survey of new US immigrants from the 2003 NIS, I created univariate and multivariate analysis of remittance level and likelihood. I found that the distribution of remittances and remittances as a percentage of income is skewed to the right, with a few immigrants sending large amounts or large proportions of their income. I found evidence against the pure altruism model of remittance behavior, showing that, in the sample of remitters, remittances are nondecreasing in recipient income. I also found that remittances may be used for investments in the home country. Finally, I found that remittance behavior varies greatly by country of nationality, and that these differences are only partially explained by observable characteristics of the immigrant, recipient family, and country.

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Table 1: Remittance Frequency and Amount (Weighted)

	Whole Sample	Restricted Sample[1]
Remit in Past 12 months = 1		
Mean	11.70%	15.40%
Nonzero Remittance Level		
Mean	$2,903	$2,950
Std. Dev.	$5,776	$5,816
5%	$100	$100
10%	$200	$200
25%	$500	$500
50%	$1,200	$1,200
75%	$3,000	$3,000
90%	$6,000	$6,000
95%	$10,000	$10,000
Obs	905	851

[1]Refers to the sample of immigrants with a close relative in the home country

Figure 1: Mean Remittance Frequency and Amount by Recipient (Restricted Sample,[1] Weighted)
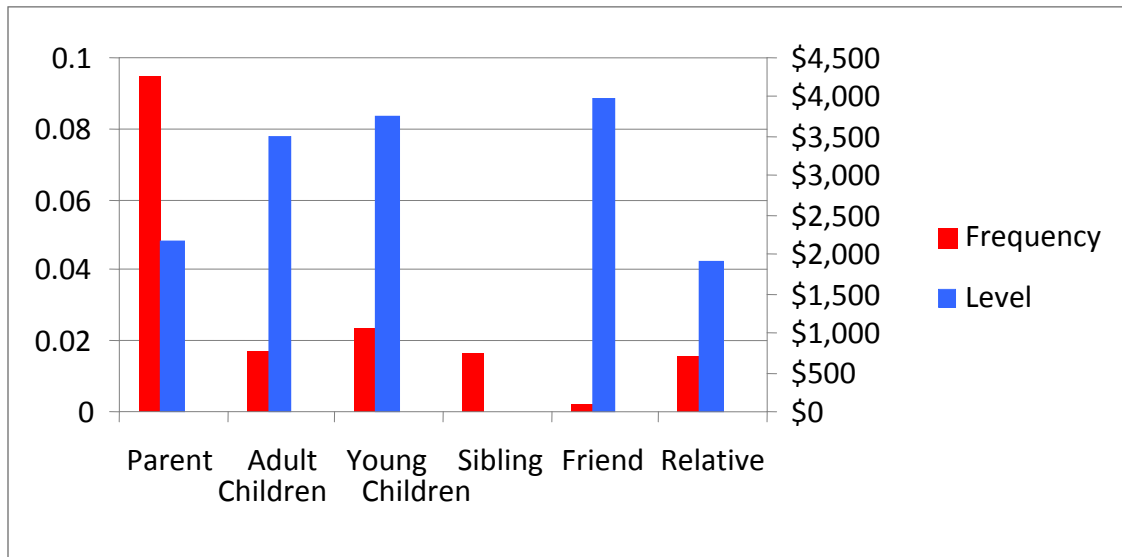
[1]Refers to the sample of immigrants with a close relative in the home country

Table 2: Remittances as a Percentage of Income

Restricted Sample[1]						
Remit /	HH Permanent Income[2]		Migrant's Current Income[3]		GDP (OER)	
	All	*Remit>0*	*All*	*Remit>0*	*All*	*Remit>0*
Mean	0.01	0.1	0.03	0.16	0.35	2.42
5%	0	0[4]	0	0	0	0.03
25%	0	0.01	0	0.03	0	0.19
50%	0	0.04	0	0.07	0	0.57
75%	0	0.11	0	0.16	0	1.7
95%	0.06	0.38	0.15	0.8	1.07	8.8
Obs.	6,029	845	2,733	541	3,873	604

[1]Refers to the sample of immigrants with a close relative in the home country
[2,3]Ratios over 2 were coded to 0 (around 10 observations for both)
[4] The ratio is displayed as 0 because of rounding

Table 3: Summary Statistics

Restricted Sample[1]	All		Remitters		Non-Remitters	
	Mean	SD	Mean	SD	Mean	SD
Demographics						
Age	38.2	12.7	37.9	10	38.2	13.2
Married, Female	0.45	0.5	0.38	0.48	0.47	0.5
Married, Male	0.37	0.48	0.44	0.5	0.36	0.48
Single, Female	0.1	0.3	0.08	0.28	0.1	0.3
Single, Male	0.08	0.27	0.1	0.3	0.08	0.26
# Children in HH	1	1.2	1.2	1.3	1	1.2
# Siblings	4.7	4.4	4.9	3.6	4.6	4.5
Migration						
Time Since 1st Entry	5.6	6.7	7.3	7.4	5.3	6.5
0 years	0.24	0.43	0.17	0.37	0.26	0.44
1-2 years	0.22	0.42	0.19	0.39	0.23	0.42
3-5 years	0.16	0.36	0.15	0.36	0.16	0.36
6-10 years	0.2	0.4	0.2	0.4	0.2	0.4
11-15 years	0.13	0.33	0.18	0.39	0.12	0.32
16+ years	0.08	0.28	0.12	0.33	0.08	0.27
Log Distance	8.6	0.8	8.5	0.7	8.6	0.8
Intent to Return	0.13	0.33	0.16	0.37	0.12	0.22
Num Re-Entries to Live	0.2	0.6	0.28	0.83	0.2	0.6
Economic Resources of Immigrant						
ln Permanent Income	9.6	0.9	9.6	0.9	9.6	0.9
ln Permanent Income HH	10.2	0.9	10.3	0.9	10.2	0.9
ln Current Income	4.9	4.9	6.8	4.7	4.6	4.9
ln Family Income	6.9	4.8	8.8	3.7	6.6	4.9
Unemployed	0.17	0.37	0.13	0.34	0.17	0.38
NILF	0.2	0.4	0.1	0.3	0.22	0.41
Holds Assets in HC	0.12	0.33	0.18	0.39	0.11	0.32
Economic Resources of Family in HC						
Income Relative to Countrymen						
Far Below Average	0.1	0.29	0.12	0.32	0.09	0.29
Below Average	0.18	0.38	0.22	0.41	0.18	0.38
Average	0.53	0.5	0.5	0.5	0.53	0.5
Above Average	0.15	0.36	0.13	0.19	0.16	0.36

Far Above Average	0.04	0.19	0.04	0.19	0.04	0.2
Rural	0.41	0.49	0.44	0.5	0.4	0.49
log gdp per capita, ppp	8.5	0.7	8.4	0.7	8.6	0.8
Unemployment Rate						
log gdp per capita, OER	7.8	1.2	7.6	1	7.8	1.2

[1]Refers to the sample of immigrants with a close relative in the home country

Table 4: Multivariate Analysis of Remittance Likelihood, Probit Estimates

Dependent Variable: Remit in Past 12 Months = 1, 0 otherwise					
	(1) Permanent HH Income	(2) Permanent Immigrant Income	(3) Current, Immigrant Income	(4) Family Income	(5) (1) + Country – GDP and ur
Demographics					
Age	-0.001	-0.000	0.001	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Married, Female	-0.029	-0.063	-0.044	-0.054	-0.037
	(0.021)	(0.030)*	(0.023)*	(0.022)*	(0.015)*
Single, Female	0.004	0.013	0.010	0.017	-0.036
	(0.023)	(0.021)	(0.024)	(0.025)	(0.018)
Single, Male	0.011	0.022	0.009	0.021	0.000
	(0.027)	(0.033)	(0.036)	(0.032)	(0.014)
# Children in HH	0.008	0.011	0.003	-0.000	0.007
	(0.006)	(0.007)	(0.009)	(0.007)	(0.004)
# Siblings	0.000	0.000	0.000	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.000)
Migration					
1-2 yrs	0.041	0.039	0.028	0.018	0.037
	(0.024)	(0.037)	(0.039)	(0.028)	(0.016)*
3-5 yrs	0.070	0.086	0.060	0.059	0.089
	(0.036)*	(0.048)	(0.060)	(0.043)	(0.027)**
6-10 yrs	0.082	0.094	0.062	0.063	0.105
	(0.036)*	(0.050)	(0.055)	(0.038)	(0.026)**
11-15 yrs	0.161	0.187	0.112	0.116	0.112
	(0.040)**	(0.047)**	(0.060)	(0.049)*	(0.024)**
16+ yrs	0.196	0.166	0.129	0.164	0.115
	(0.032)**	(0.046)**	(0.045)**	(0.039)**	(0.024)**
Intent to Return	0.064	0.087	0.054	0.093	0.059
	(0.030)*	(0.048)	(0.048)	(0.043)*	(0.026)*
Economic Resources of the Immigrant					
Income					
Permanent, HH	0.017				0.020
	(0.011)				(0.007)**
Permanent, Imm		0.021			
		(0.014)			
Current, Imm			0.017		
			(0.004)**		
Family Income				0.014	
				(0.002)**	
Unemployed***	-0.058	-0.069	0.048		-0.042
	(0.024)*	(0.034)*	(0.039)		(0.015)**
NILF	-0.100				-0.091
	(0.021)**				(0.015)**
Holds Assets in HC	0.107	0.136	0.123	0.095	0.093
	(0.040)**	(0.047)**	(0.051)*	(0.042)*	(0.021)**

Economic Resources of Family in the HC					
Income Relative to Countrymen					
Far Below Average	0.056	0.095	0.100	0.064	0.012
	(0.014)**	(0.022)**	(0.028)**	(0.020)**	(0.018)
Below Average	0.060	0.075	0.090	0.080	0.033
	(0.019)**	(0.024)**	(0.025)**	(0.023)**	(0.015)*
Above Average	-0.019	-0.017	-0.007	-0.025	-0.028
	(0.022)	(0.026)	(0.030)	(0.029)	(0.014)*
Far Above Average	-0.028	-0.041	-0.023	-0.020	-0.009
	(0.027)	(0.040)	(0.029)	(0.031)	(0.027)
Rural	0.021	0.029	0.004	0.018	-0.001
	(0.013)	(0.014)*	(0.020)	(0.015)	(0.008)
Log GDP (OER)	-0.050	-0.058	-0.059	-0.059	
	(0.015)**	(0.015)**	(0.016)**	(0.016)**	
Unemployment Rt.	0.004	0.004	0.002	0.004	
	(0.003)	(0.002)	(0.003)	(0.003)	
Sample Frequency	21%	18%	21%	20%	17%
Pseudo R Squared	.07	.08	.08	.08	.08
Observations**	3529	2322	2394	2903	5916

Marginal Effects Evaluated at the Mean of Regressors

Robust standard errors in parentheses (clustered by country of nationality)

* significant at 5%; ** significant at 1%

Columns 2 and 3 exclude immigrants who are not in the labor force, and column 4 excludes immigrants for whom the HH is not in the labor force

Unemployed refers to immigrant in all columns but last, in which it refers to the head of household

Not reported: effects on dummy for missing observations in "return" variable (questionnaire uses a random skip on that question), effects on country indicators

Estimation sample consists of immigrants with a close relative in the home country

Table 5: Multivariate Analysis of Remittance Level: OLS Estimates

Dependent Variable: Log of positive remittances						
	(1) GDP—Official Exchange Rate	(2) add time since entry	(3) add countries, take away GDP, ur	(4) GDP—PPP	(5) add time since entry	(6) add countries, take away GDP, ur
Demographics						
Age	0.006	0.006	0.003	0.007	0.005	-0.001
	(0.006)	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)
Married, Female	-0.081	-0.057	-0.007	-0.056	-0.026	-0.009
	(0.102)	(0.122)	(0.147)	(0.096)	(0.115)	(0.122)
Single, Female	0.044	0.145	0.170	0.136	0.235	0.119
	(0.150)	(0.153)	(0.193)	(0.156)	(0.164)	(0.193)
Single, Male	-0.074	-0.014	0.030	0.016	0.088	0.032
	(0.209)	(0.223)	(0.245)	(0.192)	(0.204)	(0.250)
# Children in HH	0.035	0.052	0.077	0.044	0.053	0.064
	(0.036)	(0.036)	(0.044)	(0.036)	(0.034)	(0.040)
# Siblings	0.010	-0.000	0.016	0.007	-0.002	0.015
	(0.013)	(0.014)	(0.013)	(0.013)	(0.012)	(0.011)
Migration						
Intent to Return	0.255	0.189	0.187	0.297	0.224	0.216
	(0.159)	(0.154)	(0.137)	(0.155)	(0.152)	(0.109)
Time Since First Entry to US						
1-2 yrs.		0.284	0.290		0.232	0.379
		(0.233)	(0.236)		(0.204)	(0.167)*
3-5 yrs.		0.406	0.533		0.389	0.736
		(0.263)	(0.292)		(0.229)	(0.227)**
6-10 yrs.		0.881	0.858		0.882	0.947
		(0.146)**	(0.169)**		(0.144)**	(0.154)**
11-15 yrs.		0.593	0.638		0.586	0.992
		(0.197)**	(0.254)*		(0.191)**	(0.257)**
16+ yrs.		0.512	0.576		0.483	0.851
		(0.156)**	(0.185)**		(0.156)**	(0.168)
	Economic Resources of the Immigrant					
Permanent Income HH	0.375	0.355	0.253	0.372	0.356	0.284
	(0.095)**	(0.089)**	(0.096)*	(0.089)**	(0.080)**	(0.072)**
NILF	-0.368	-0.245	-0.358	-0.404	-0.284	-0.363
	(0.263)	(0.238)	(0.281)	(0.244)	(0.231)	(0.220)
Unemployed	-0.383	-0.161	-0.175	-0.377	-0.141	-0.112
	(0.166)*	(0.227)	(0.224)	(0.161)*	(0.228)	(0.155)
Holds Assets in HC	0.078	0.241	0.241	0.083	0.248	0.293
	(0.122)	(0.109)*	(0.109)*	(0.112)	(0.105)*	(0.099)***
Economic Resources of Family in the Home Country						
Income Relative to Countrymen						

Far Below Avg	0.414	0.410	0.378	0.368	0.362	0.361
	(0.196)*	(0.203)	(0.177)*	(0.176)*	(0.182)	(0.133)*
Below Avg	0.137	0.139	0.136	0.129	0.126	0.134
	(0.143)	(0.155)	(0.161)	(0.137)	(0.142)	(0.148)
Above Avg	0.616	0.530	0.473	0.595	0.509	0.375
	(0.122)**	(0.138)**	(0.129)**	(0.130)**	(0.136)**	(0.136)*
Far Above Avg	0.845	0.645	0.580	0.746	0.541	0.449
	(0.185)**	(0.171)**	(0.170)**	(0.169)**	(0.167)**	(0.132)**
Rural	-0.105	-0.110	-0.105	-0.096	-0.110	-0.196
	(0.131)	(0.133)	(0.158)	(0.129)	(0.131)	(0.137)
Log GDP per capita (OER)	0.075	0.024	0.169			
	(0.094)	(0.091)	(0.075)*			
Unemployment Rt	0.010	0.016	0.051			
	(0.018)	(0.016)	(0.007)**			
Log GDP per capita (ppp)				0.167	0.132	
				(0.097)	(0.090)	
Constant	2.274	2.408	1.891	1.476	1.578	3.276
	(1.273)	(1.206)	(1.327)	(1.115)	(1.078)	(0.670)**
Observations	568	556	556	609	597	826
R-squared	0.11	0.14	0.19	0.11	0.15	0.18

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%
Not reported: coefficient estimate for indicator for missing "return" responses—random skip question, coefficient estimates on country indicators
Estimation sample consists of remitters with a close relative in the home country

Table 6a: Marginal Effects and Std Error on Country Indicators in Probit Analysis

Country	Canada	China	Colombia	Cuba	Dominican Republic	El Salvador	Ethiopia	Guatemala	Haiti	India
Marg. Effect	-0.065	0.065	-0.040	-0.008	0.192	0.132	0.050	0.145	-0.056	0.001
Std Error	(0.017)**	(0.031)*	(0.021)	(0.026)	(0.044)**	(0.031)**	(0.031)	(0.032)**	(0.023)*	(0.017)**
Country	Jamaica	Korea	Nigeria	Peru	Philippines	Poland	Russia	Ukraine	United Kingdom	Vietnam
Marg. Effect	-0.008	-0.120	0.150	0.016	0.125	-0.022	-0.020	0.026	-0.137	-0.030
Std. Error	(0.026)	(0.018)**	(0.038)**	(0.028)	(0.036)**	(0.023)	(0.024)	(0.030)	(0.009)**	(0.026)

Table 6b: Marginal Effects and Std Error on Country Indicators in OLS Analysis

Country	Canada	China	Colombia	Cuba	Dominican Republic	El Salvador	Ethiopia	Guatemala	Haiti	India
Marg. Effect	1.319	0.594	-0.048	-0.145	0.213	-0.058	-0.135	0.058	0.256	0.335
Std Error	(0.134)**	(0.092)**	(0.135)	(0.139)	(0.118)	(0.104)	(0.052)*	(0.117)	(0.167)	(0.108)**
Country	Jamaica	Korea	Nigeria	Peru	Philippines	Poland	Russia	Ukraine	United Kingdom	Vietnam
Marg. Effect	-1.964	-0.204	-0.068	-0.130	0.349	0.684	0.090	0.106	-1.026	-0.350
Std. Error	(0.209)**	(0.139)	(0.075)	(0.131)	(0.106)**	(0.112)**	(0.160)	(0.093)	(0.282)**	(0.161)*

Effects on continent indicators (reported for those observations for which country of nationality is not given) not reported in Tables 6a and 6b
Mexico is the reference category
Estimation sample consists of immigrants (6a) or remitters (6b) with a close relative in the home country

Table 7: Remittance-Income Elasticities					
OLS Specification:	(1)	(2)	(3)	(4)	(5)
Income Type:					
Permanent Income (HH)	0.38 (0.095)**	0.36 (0.089)**	0.37 (0.089)**	0.36 (0.080)**	0.28 (0.072)**
Permanent Income (Imm)		0.38 (0.082)**			
Current Income (Imm)		0.12 (0.035)**			
Family Income		0.07 (0.04)			

Permanent income estimates and current income are calculated from wages and salary. Family income includes wage and salary income as well as asset income.
Estimation sample consists of remitters with a close relative in the home country

Table 8: Determinants of the Differences in Remittance Frequency by Country of Nationality, GLS Regression Results

Dependent Variable: Coefficients from Linear Probability Estimates			
	(1)	(2)	(3)
Log GDP per capita, 2003 PPP	-0.050	-0.001	0.039
	(0.019)**	(0.023)	(0.030)
GDP growth 1970-2003	-0.019	-0.023	-0.013
	(0.032)	(0.027)	(0.031)
Openness (Sachs&Warner), 1965-90		-0.196	-0.236
		(0.065)***	(0.064)***
Infant Mortality			0.004
			(0.002)*
Log(Distance)			-0.004
			(0.020)
Constant	0.446	0.086	-0.322
	(0.158)**	(0.177)	(0.347)
Adjusted R-squared	0.23	0.48	0.55

Standard errors in parentheses
* significant at 10% ** significant at 5%; *** significant at 1%
Not reported: coefficients on indicators for whether or not growth is missing or distance is missing

Table 9: Determinants of the Differences in Remittance Amount by Country of Nationality, GLS Regression Results

Dependent Variable: Country Coefficients from OLS Estimates			
	(1)	(2)	(3)
GDP per capita, 2003 PPP	-0.124	0.155	0.393
	(0.160)	(0.213)	(0.279)
GDP growth 1970-2003	0.350	0.328	0.681
	(0.269)	(0.252)	(0.287)**
Openness (Sachs&Warner), 1965-90		-1.131	-1.440
		(0.611)*	(0.595)**
Infant Mortality			0.038
			(0.023)
Log(Distance)			-0.302
			(0.187)
Constant	0.426	-1.648	-2.592
	(1.309)	(1.664)	(3.229)
Observations	21	21	21
Adjusted R-squared	-.06	0.08	0.20

Standard errors in parentheses
* significant at 10% ** significant at 5%; *** significant at 1%
Not reported: coefficients on indicators for whether or not growth is missing or distance is missing

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