

# International Remittances and Migrant Portfolio Interests

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## Abstract

Migration takes place for many reasons. Consequently, it should not come as a surprise that remittances –the earnings that immigrants send home– might also be sent for a plethora of motives. Using a recent and representative Spanish database on immigrants from all across the globe, we provide some evidence of how remittances not only respond to altruistic motives but, also, to migrants' portfolio interests. Specifically, immigrants remit more when home per capita growth rates rise relative to those rates in Spain, when the home-host real interest rate differential increases, and when real exchange rate uncertainty rises. Although portfolio variables do not matter uniformly across the globe, the fact that economic conditions at home influence remittance flows casts doubt on whether remittances can be counted upon to stabilize developing economies.

We are grateful for comments received at the Population Association of America meetings.

## I. Introduction

The popular literature tends to characterize international remittances as the flow of resources from better off individuals to family in need. As such, remittances are typically considered to be altruistic in nature. Migration scholars, however, are well aware that remittances are sent home for many other reasons as well, such as to repay loans to family who financed migration, to accumulate retirement assets, for insurance purposes, or to save toward a “target purchase” (*e.g.* a plot of farm land, a taxi, or a home). We concur that immigrants remit for a variety of reasons and, in particular, focus on immigrants’ remitting as a means to accumulate assets in the home country.

Immigrants accumulate assets and save for many of the same reasons that non-migrants accumulate assets. However, immigrants differ from non-migrants in that they can easily accumulate assets in two different locations, *i.e.* the host and the home countries. While it is often recognized that immigrants do hold assets both at home and abroad (*e.g.* see Gammage, 2007), few empirical investigations have sought to link relative macroeconomic conditions in the home and the host countries –what we refer to as *portfolio variables*– to individual migrants’ remitting behavior. We provide evidence that migrants’ remitting is not solely driven by altruism but, also by investment motives. Variations in remittances in response to movements in portfolio variables suggest that immigrants are adjusting their portfolio of assets at home and in the host country to take advantage of changing economic opportunities.

The relative absence of remittance studies examining the link between migrants’ remitting patterns and portfolio variables is likely due to lack of adequate data. Much of the more representative data on remittances come from surveys that focus on migrants originating

from a particular region.<sup>1</sup> For instance, there are various larger surveys that detail remittance flows from Mexican migrants to their families back in Mexico, such as the *Mexican Migration Project* or the *Encuesta de Migración de la Frontera Norte*. Nevertheless, because most of the remittance flows in these two surveys originate in the same host country (*i.e.* the U.S.) and are sent to the same home country (*i.e.* Mexico) and are a one-time snapshot of each migrant's flows, these surveys cannot be used to observe how changing portfolio conditions affect remittances. With no cross-country or cross-time variation in macroeconomic conditions, we cannot link portfolio variables reflecting market conditions to remittance flows.

In this study, we make use of a brand new immigrant survey released by the Spanish Statistical Institute (*Instituto Nacional de Estadística*, INE), *i.e.* the *Encuesta Nacional de Inmigrantes* (ENI). This Spanish immigration survey is ideal for the study at hand for various reasons. First, it is designed to be representative of the current immigrant stock in Spain. Second, the survey informs on the remitting behavior of a very geographically diverse group of immigrants instead of focusing on a country-specific group of migrants. Indeed, the ENI benefits from the fact that Spain hosts immigrants from all Latin America, from numerous African nations, from a diverse number of European countries (members and non-members of the European Union) and from a handful of Asian nations. This diversity of origins allows us to examine migrants' remitting behavior in response to cross-country variations in exchange-rate movements and other market conditions.

We note that Spain has experienced an impressive growth in its immigrant population over the past 15 years. Within a decade, the country saw its foreign-born population quadruple from 1.2 percent of the adult population (300,000 individuals) in 1991 to 4.0 percent (1,370,000

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<sup>1</sup> There are a large number of small immigrant surveys carried out by a variety of research institutes and NGOs in the U.S. Unfortunately, most of these surveys are not designed to be representative of the migrant population in the host country, unlike the survey we use in this manuscript.

individuals) in 2001 (*España en Cifras, 2008*, available at: <http://www.ine.es/prodyser/pubweb/escif/escif.htm>). Between 2001 and 2005, the foreign-born doubled to account for 8.0 percent of the population (3,100,000 individuals) and, by the time the ENI was implemented in 2007, immigrants represented 10 percent of the population (*i.e.* 4.5 million immigrants out of 45.2 million inhabitants). This unparalleled growth of the immigrant population has also been accompanied by a rapid growth of remittances, making Spain one of the leading countries from which remittance flows originate after the U.S.

Understanding whether and to what degree immigrants' remitting patterns respond to portfolio variables is useful in order to better assess the likely pattern of immigrant remittances (and of foreign exchange inflows) due to variations in market conditions. For instance, are remittances counter-cyclical tending to shore up the economy during an economic downturn? Or are remittances pro-cyclical, rising during an economic boom and falling during an economic downturn as investment conditions deteriorate? The current literature seems to primarily characterize remittances as counter-cyclical or a-cyclical. Several studies have argued that remittances serve as a reliable source of foreign exchange and, as a result, countries with large emigrant populations are believed to be less susceptible to currency crises (Ratha 2004, Bugamelli and Paterno 2005). However, if remitters are responsive to portfolio variables, remittances may not constitute a reliable source of foreign exchange to counteract speculative outflows and idiosyncratic economic downturns. If so, countries with large emigrant populations should avoid growing accustomed to remittance inflows. This concern has been partially nourished by recent press reports regarding how the growth of remittance flows to Latin American countries appears to have stalled over the past two years. Our study sheds some light on the possibility that observed variation in flows is partially linked to portfolio considerations.

## **II. Background on Immigration to Spain**

Before proceeding any further, it is important to provide an overview of immigration to Spain. Until quite recently, Spain was a country of emigrants. However, the arrival of democracy in 1975, as well as the increase in unemployment that hit quite a few of the host countries that previously attracted Spaniards, abruptly reversed Spanish migratory flows. Since the year 2000, Spain has displayed one of the largest rates of immigration in the world –three to four times as large as the average immigration rate in the U.S. The Spanish National Institute of Statistics (INE) estimated that 10 percent of all Spanish residents had a foreign nationality in 2007.

This new immigrant population is concentrated in specific regions of Spain, particularly Andalucía, the Balearic Islands, the Canary Islands, Cataluña, Valencia, Madrid and Murcia. In 1991, these Spanish regions accounted for 78 percent of all immigrants. Spanish immigrants originate from all regions of the world. Table A indicates the regions we focus on in this study, i.e. the Americas, Europe, Africa and Asia. According to the figures in Table B in the appendix, approximately 41 percent of immigrants in our sample originate in the Americas, about 39 percent from Europe, 16 percent from Africa, and a handful from Asia and Oceania. The most common countries of origin for immigrants in our sample are:<sup>2</sup> Morocco, Rumania, Ecuador, Colombia, France, Argentina, and the U.K. These nations correlate with the most common nationalities among Spanish immigrants according to the INE.

## **III. Remittances and Asset Accumulation**

There is a small literature attempting to relate migrant remittances to asset accumulation in the home community. Some studies rely on migrants' self-reports regarding the purpose for

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<sup>2</sup> Countries of origin for more than 5 percent of the entire immigrant sample in the ENI.

which they remit money home. In this vein, the latest *Mexican Migration Project* database (*i.e.* the MMP118) reveals that about 11 percent of Mexicans who migrate to the U.S. and remit money home claim asset accumulation as the primary motive for remitting.<sup>3</sup> While this information is interesting and does suggest that there are many motives for remitting, including an asset accumulation motive, we still lack information on the influence of portfolio variables on migrants' remitting behavior.

Another set of studies compares expenditure patterns of remittance-receiving households and non-receiving households. Using the *Mexican National Rural Household Survey*, Taylor and Mora (2006) conclude that households affected by international migration (and presumably receiving remittances) modify their expenditure patterns by increasing their share of expenditures on investment at the expense of consumption. Likewise, Adams (2005) finds that remittance-receiving households in Guatemala spend less on consumption (defined as food, consumer goods and durables), and more on education, health and real estate relative to non-remittance receiving households. Similar findings are also reported by Zarate-Hoyos (2004) and Airola (2007). While these studies do appear to link remittances with asset accumulation, they do not link portfolio variables to remitting patterns as the data focus on households in the origin communities and not on the migrants sending money home.

There is a third set of studies related to the aim of this paper, *i.e.* to link relative macroeconomic conditions in the home and the host countries to migrants' remitting patterns and, in turn, hypothesize about the importance of portfolio interests in driving migrants' remitting patterns. They focus on testing whether there is an association between

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<sup>3</sup> Authors' tabulations using the MMP118 and classifying the following categories as asset accumulation: construction or repair of a home, debt payment, saving, purchase of a home or lot, education expense, start/expand a business, purchase of agricultural inputs, purchase of livestock, purchase of a vehicle, purchase of tools. We excluded the category "unknown" in this tabulation.

macroeconomic variables, such as the exchange rate and interest rates, to remittances received by labor exporting nations. Faini (1994), Lianos (1997) and Higgins *et al.* (2004) all take this approach and estimate aggregate macroeconomic remittance functions. These studies conclude that certain portfolio variables –in particular the exchange rate– explain variations in the levels of total remittances received by labor exporting countries. However, their findings are not consistent. For example, Faini (1994) and Higgins *et al.* (2004) find that home country real exchange rate depreciation increases remittance flows, while Lianos (1997) finds that nominal depreciation of home currency reduces the level of remittances sent home. More important to us is the fact that these studies estimate *aggregate* remittance inflows and, thus, cannot inform directly on portfolio motives. *Aggregate* data do not allow us to track how portfolio variables affect remittances because they do not inform where the remittances received by each country originate from. For example, remittance inflows to Colombia originate not only from Spain, but also from the U.S., Argentina, and many other countries where Colombian migrants settle. It is unclear then what the relationship between the *average multilateral exchange rate* (which could be made up of some currencies rising and others falling in relation to the Colombian peso) and *aggregate inflows* reveals about individual level remittance responses to portfolio variables.

Also related to the linking of macroeconomic conditions to migrants' remittances is the study by Pozo and Vargas-Silva (2006). The authors rely on individual level data from the *Legalized Population Survey* (LPS) –a survey carried out by the U.S. Department of Labor in 1987 and, again, in 1991 on a sample of undocumented migrants who adjusted their status following the passage of the Immigration Reform and Control Act (IRCA). They use these data to examine how migrant remitting patterns respond to macroeconomic variables in their home countries. They exploit the cross-country nature of this survey (with approximately 50 percent

of the respondents coming from Mexico and the other 50 percent from around the globe) and find that individuals originating from countries that experience depreciation of the home currency tends to increase their remittances home. In contrast, individuals originating from countries that experience greater uncertainty in the home/host exchange rate tend to reduce their remittance outflows. While this paper is more closely related to the present study, it works with a selected sample of migrants, as is the case with newly legalized immigrants. As noted by Amuedo-Dorantes and Mazzolari (2010), there are reasons to believe that the remitting behavior of immigrants significantly changes post-legalization. Therefore, one has to be careful when making inferences about the portfolio or investment motives behind migrants' remitting patterns when working with that sample. Additionally, the LPS survey was conducted approximately 15 years ago. Given the transformed macroeconomic setting, one may question the relevance of findings using such data today.

In sum, there have been studies that examine the link between remittances and asset accumulation from a variety of perspectives –including studies that use information on the intentions of remitters, studies that examine the differential spending patterns of remittance-receiving and non-receiving households, studies that gauge how aggregate remittance inflows respond to changes in multilateral economic conditions, and one that analyzes how (15 years ago) the remitting behavior of newly legalized immigrants from the LPS responded to conditions in their home countries. Yet, these disparate approaches have not yielded consistent findings regarding the impact of portfolio variables on migrants' remitting patterns.

#### **IV. Testable Hypotheses and Methodology**

Our primary aim is to assess whether migrants attend to investment or portfolio interests when remitting money home and, if so, to what extent. Our data do not allow us to directly



examine immigrants' investment or asset accumulation behavior. However, we can gauge how migrants' remitting patterns respond to variables capturing changes in macroeconomic conditions in the home and host countries and, thereby, infer whether remittances are partially driven by investment-related or what we refer to in this paper as portfolio variables. With that intent, we model Spanish immigrants' remitting as follows:

$$(1) \quad R_i = a_1 + a_2 I + a_3 F + a_4 P + a_5 R + e_i$$

where  $R$  is the euro amount remitted last year by the  $i$ th immigrant.  $I$  is a vector of personal characteristics, including gender, age, education, Spanish fluency, time in Spain, work and immigration status. The vector  $F$  includes information on family characteristics, such as marital status, the number of children residing in the Spanish household, back in the home country and elsewhere, and information on plans of family reunification in Spain and on plans of returning home in the next five years.

Crucial in our study is  $P$  –a vector of portfolio variables capturing changes and differences in market conditions and portfolio returns in the home and host communities. This vector includes real depreciations of the home currency (relative to the euro) and real exchange rate uncertainty.<sup>4</sup> We also include information on differences in real deposit interest rates and differences in per capita GDP growth rates between the home country and Spain to further capture relative economic conditions at the two locations. Some of these portfolio variables (real interest rate differentials and real exchange rate uncertainty) allow us to distinguish portfolio-minded remitters from altruistically-minded remitters. The other two portfolio variables (real growth rate differentials and real exchange rate depreciations) cannot always distinguish the portfolio motive from the altruistic motive for remitting because they have the potential to

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<sup>4</sup> We use the term *uncertainty* to refer to our proxy of exchange risk as measured by the standard deviation of the monthly log differenced real exchange rate.

influence both portfolio-minded and altruistically-minded remitters. Nevertheless, they are still important when trying to capture changes in market conditions. Finally, the vector  $R$  includes a set of dummy variables indicative of the Spanish region where immigrants reside to address regional differences –including cost of living and remittance sending infrastructure– that could contribute toward differences in immigrants’ remitting behavior.

We hypothesize that, if migrants have asset accumulation purposes in mind when sending money home, we should observe some predictable patterns in their remitting patterns. In some cases, these patterns are fairly obvious and, in other cases, less so. Before turning to our data and to the econometric methodology, we map out these patterns for the four portfolio variables included in our model.

**A) Real Interest Rate Differentials:** Cross-country movements in real interest rate differentials will change relative returns to financial assets held in the home versus the host countries in a very predictable manner. If remitters are portfolio-minded, remittances should rise with home-country real interest rates and fall with host country real interest rates, *ceteris paribus*. Hence, we incorporate the differential between real home-country interest rates and real host-country interest rates in the model. We expect that remittances to the home country will rise with the differential if remitters are portfolio-minded. If immigrants are remitting to simply finance the current consumption needs of family members left behind (such as paying for rent or for food), there is no reason for remittance flows to change in response to variations in the relative rate of return to investments at home versus abroad.

**B) Per Capita GDP Growth Rate Differentials:** Unlike real interest rate differentials, changes in per capita GDP growth rate differentials cannot be used unequivocally to distinguish between altruistically-minded and portfolio-minded immigrants. A higher per capita GDP

growth rate in the home country reflects a prosperous economy back home and the possibility of higher returns for investment endeavors, possibly raising remittances sent with investment purposes. Altruistically minded remitters are, on the other hand, likely to reduce remittances sent home with increases in home growth rates, as home family are less likely to be resource-constrained. One might be tempted to distinguish portfolio-minded from altruistically-minded immigrants by the sign on the per capita GDP growth rate differential in equation (1). However, it can also be argued that slower growth back home (especially if it is negative) might induce increased investments by migrants who may be in the position to take advantage of “fire sales” – buying real assets when they become relative cheap due to crisis situations. Hence, only when the coefficient on this variable is positive can it yield evidence of a portfolio motive.

**C) Real Exchange Rate Movements:** An understanding of money flows across borders needs to address the potential impact of the real exchange rate. Hence, in addition to interest and GDP growth rate differentials, we assess the impact of exchange rate movements on immigrants’ portfolio interests. The real exchange rate is defined as:

$$\frac{e_{Home\ currency/euro} \times P_{Spain}}{P_{Home}}$$

where  $e_{Home\ currency/euro}$  is the market (or nominal) exchange rate while  $P_{Spain}$  and  $P_{Home}$  are price indexes for the host and home countries.  $P_{Spain}$  tracks the cost of goods and assets (such as land, housing and durables) in Spain, while  $P_{Home}$  tracks the same in the home country. By multiplying the Spanish price index by the nominal exchange rate, the two price series are expressed in a common currency. Therefore, a rise in the ratio (real depreciation of the home currency or real appreciation of the euro) implies that the cost of goods and the value of physical assets have risen in Spain relative to the home country.

How will the Spanish immigrant investor respond to depreciation of the home currency? It depends on a number of factors. First of all, it depends on whether the immigrant currently owns assets at home, in Spain or, if in both places, on their relative weights in the portfolio. If the immigrant has assets back home, their value in terms of Spanish assets has declined, making the immigrant less wealthy. This wealth effect will likely reduce remittances sent home. If the immigrant, on the other hand, owns assets in Spain, s/he is now wealthier. The increased wealth will increase remittance transfers. Secondly, there is a relative price effect associated with the real exchange rate depreciation. The change in relative prices makes the acquisition of home assets more desirable since it is now relatively cheaper to buy home assets. This could induce the immigrant to substitute away from assets held in Spain in favor of assets held at home – thereby increasing remittances sent back home for asset acquisition. In sum, it is unclear how real exchange rate depreciation will impact remittances sent home. The price effect would predict an increase in remittances sent home, while the wealth effect can affect remittance flows in either direction. The more home assets the migrant has in their country of origin, the more likely the wealth effect will be negative and override the positive price effect, leading to a reduction in remittances.

Among altruistically-minded immigrants, real exchange rate depreciation can either increase or decrease remittances sent home. On the one hand, now that the cost of acquiring goods back home has decreased, the immigrant might send more money home to allow family members to take advantage of the relative price difference and increase their current consumption. On the other hand, if the immigrant is simply sending money to finance a particular consumption level (*i.e.* make a rent or mortgage payment), remittance flows might decrease since consumption can now be financed with fewer euros.

**D) Exchange Rate Risk:** The final macroeconomic variable included in the analysis is exchange rate risk as captured by real exchange rate volatility. To understand how exchange risk can impact remittances consider the fact that the immigrant has the possibility of acquiring assets in two locations: Spain and the home country. The expected return to the immigrant's portfolio is simply the weighted average of the expected returns in the two countries:

$$E(R_{portfolio}) = \omega_s E(S) + \omega_h E(H) \quad (2)$$

where:  $\omega_s$  and  $\omega_h$  are the weights of the portfolio shares in Spain and at home and they sum to 1. S and H are returns of Euro-denominated assets and home currency-denominated assets, respectively. We normally assume that the investor desires a high expected return with a low variance in that return. The variance of the two asset portfolio can be expressed as:

$$\sigma^2_{portfolio} = \omega_s \sigma_s^2 + \omega_h \sigma_h^2 + 2\omega_s \omega_h COV(SH) \quad (3)$$

Hence, the variance of the portfolio will depend directly on the variance of the asset values and on their covariance. The latter can be zero, positive or negative. Therefore, increases in uncertainty in the real exchange rate will change the value of  $\sigma^2_{portfolio}$  and are expected to be followed by a re-organization of the immigrant's portfolio. The latter may involve increasing the relative share of home assets by remitting more, or increasing the relative share of Spanish assets by remitting less. Therefore, while we cannot predict how increases in real exchange rate uncertainty will ultimately impact remittances, they are expected to change portfolio risk and remittances sent for investment purposes. In contrast, if remittances are simply used to make altruistic transfers (to attend to immediate consumption needs of family back home), there is no reason for remittances to vary with changes in exchange-rate uncertainty.

In sum, we estimate equation (1) as a Tobit model to address the zeros in the sample owing to the ongoing selection into remitting. We argue that variations in portfolio variables

will alter migrants' remitting patterns as migrants reorganize their portfolios in light of those changing conditions. In particular, non-zero responses to interest rate differentials and variations in real exchange rate uncertainty are indicative of remittances being sent for portfolio considerations. We expect increases in home/host interest rate differentials to raise migrants' remittances sent for investment purposes, while increases in exchange risk could either increase or decrease remittances sent for investment purposes. Yet, there is no reason for changes in real interest rate differentials or exchange risk to impact remittances flows if these are sent for altruistic purposes.

We also include two other portfolio variables –real growth rate differentials and real exchange rate depreciation. Increases in the home versus host country real growth rate differentials may increase or decrease remittances sent for investment purposes, but they are only expected to decrease remittances sent for altruistic purposes. Therefore, a positive coefficient on the real growth rate differential suggests that remittances are sent for investment purposes, whereas a negative coefficient does not allow us to distinguish between altruistic and investment motives. Finally, a depreciated home currency can raise or lower remittances sent for investment purposes. However, it can also raise or lower remittances sent for altruistic purposes. As such, real exchange rate movements do not allow us to distinguish between altruistic and investment motives regardless of their link to the migrant's remitting behavior.

## **V. The Data**

We rely on data from the new Spanish immigration survey, the *Encuesta Nacional de Inmigrantes* (ENI). The ENI is, at the moment, a onetime survey carried out by the Spanish Statistical Institute (INE) on foreign-born individuals, at least sixteen years of age, residing in the Spain. The INE relied on the 2005 municipal population registers to extract a representative

sample of the immigrant population. Unlike the Census, the municipal register or *Padrón Municipal* typically provides the most representative immigrant count as registering in it grants immigrants the right to medical and other municipal services. The ENI was implemented over the four-month period running between November 2006 and February 2007. While most information in the survey refers to the previous week, some questions refer to a different time period. For instance, the remittance question refers to the euro amount sent by immigrants during the previous year.

Table 1 displays the average characteristics of all immigrants in the survey and of immigrants by continent of origin. About 55 percent of Spanish immigrants are female and, on average, they are 39 years old and have been in Spain for 13 years. Approximately 65 percent of them are fluent in Spanish and they are fairly well-educated, with almost a quarter of them reporting having a tertiary or university education. About half of the migrants in our sample are married and approximately 61 percent have children living with them in Spain. Sixty-four percent of migrants are employed and 92 percent are documented. Finally, a quarter of immigrants plan on bringing family to Spain and about 7 percent expect to return to their home country within 5 years.

Characteristics of immigrants from Africa, the Americas, Asia and Europe<sup>5</sup> are displayed in the last five columns of Table 1. There is considerable diversity in personal and family migrant characteristics according to their origins. Immigrants from Africa and Asia are more likely to be male relative to immigrants from the Americas or Europe. Immigrants from the Americas have arrived more recently, while African migrants display the longest migration spells. Asian and African immigrants are the least likely to be fluent in Spanish, with African

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<sup>5</sup> While Oceania is in the full sample, we do not report disaggregated results for Oceania due to the very limited number of observations on immigrants from that continent – a total of 30 in the entire survey.

immigrants reporting the least education of all migrants. Immigrants from the Americas are the least likely to be married and legal. Asian immigrants are more likely to have assets back home, while American immigrants are more likely to report planning to return home within the next 5 years. In contrast, African immigrants are much more likely to have intentions of family reunification in Spain. Overall, it appears that immigrants from the different world regions differ in their personal and family characteristics, pointing to also potentially distinct motives for migrating and remitting.

Average remitting rates and the average amount sent by immigrants who remit are reported in Table 2. Immigrants from the Americas seem the most likely to remit, with almost half of them doing so in 2006. Immigrants from Oceania and Europe are much less likely to remit, which suggests that they might differ with respect to their remitting motives from African, American or Asian immigrants. Finally, Asian and American immigrants are, on average, remitting the largest sums of money, followed by immigrants from Europe and Africa.

Who remits? Table 3 addresses that question with a summary of the characteristics of remitters by region of origin. When compared to the migrant characteristics in Table 1, these means are reasonable. For example, a higher fraction of remitters from Africa are male, which is not surprising as African migrants are predominantly male. Only 29 percent of African remitters have assets back home. Yet, this fraction is not low given that only 20 percent of African immigrants report having assets back home. Additionally, the figures in Table 3 indicate that remitters (as opposed to the general population of immigrants) are generally characterized with shorter Spanish residencies, similar educational attainment, higher employment and also higher home country asset ownership rates than the average migrant from the same region. Additionally, remitters are generally more likely to be documented and to have plans for



returning home in the next five years. Yet, we also find that remitters, relative to non-remitters, are more likely to claim that they have plans to bring their families to Spain, thus hinting on immigrants' potentially diverse migration and remitting plans.

In order to determine whether relative macroeconomic conditions in the home and host countries impact the remitting patterns of immigrants in our sample, we match 2006 macroeconomic home and host countries' conditions to each observation in the survey. For example, for immigrants from Argentina, we have information on the average monthly rate of real depreciation of the Argentinean peso against the euro, on the difference in Argentinean and Spanish real deposit interest rates, on the difference in per capita GDP growth rates between Argentina and Spain and on the uncertainty of the real Argentinean peso/euro exchange rate – which is measured as the standard deviation in monthly real exchange rate changes for that currency pair over the year.<sup>6</sup> Table 4 displays the average economic conditions in each of the continents included in the study as well as in Spain. It is worth noting that average real exchange rate depreciation of the domestic currency with respect to the euro is greatest in the Americas and smallest in Africa. Asian currencies appear to suffer from the greatest amount of exchange rate uncertainty, while exchange rate uncertainty is lowest in Africa. Inflation is highest in the Americas, as are nominal deposit interest rates. Finally, per capita GDP growth rates are highest for Asia and lowest for Spain. Overall, the figures in Table 4 suggest potentially diverging remitting patterns of immigrants according to their region of origin.

## **VI. Do Remittances Respond to Portfolio Interests?**

Our goal is to examine whether migrants attend to investment or portfolio interests when remitting money home. With that purpose in mind, we first estimate a Tobit model of the euro

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<sup>6</sup> Please refer to the data appendix for details on the construction of these variables and for information on the macroeconomic data sources.

amount remitted yearly by all migrants in our sample. Subsequently, in an effort to separate portfolio-minded from altruistically-minded remitters and better gauge the existence of a portfolio motive for remitting money back home, we distinguish immigrants according to their ownership of home country assets. We hypothesize that migrants who own home country assets are more likely to vary remittances due to movements in portfolio variables relative to immigrants who do not own any assets back home. In a final step, due to the marked differences across the various regions of origin of migrants in our sample, we examine the remitting behavior of immigrants according to their region of origin. This analysis allows us to uncover important differences in migrants' remitting patterns not apparent in the estimations that aggregate all immigrants.

#### **A) Evidence from All Immigrants**

Table 5 presents the coefficients, standard errors and marginal effects for both the likelihood of remitting money home and for the euro amount remitted yearly by migrants from the Tobit model estimated using the full sample of immigrants. Recall that equation (1) includes four vectors of regressors: a vector of personal-level (immigrant-level) characteristics, a vector of household-level descriptors, a vector of portfolio variables, and a vector of regional dummies. For the sake of brevity, we quickly comment on the personal and family characteristics affecting migrants' remitting behavior to more thoroughly focus on the discussion of the impact of portfolio variables.

A number of personal characteristics seem to impact the likelihood of remitting and the euro amount remitted by migrants on a yearly basis. Older migrants, as well as their employed counterparts, are more likely to remit. We also find that immigrants who own assets back home are more likely to remit and remit higher sums. Such a finding is consistent with the idea that

migrants with assets in the home community have revealed a preference for home investment and that remittances are sent to either maintain (Lucas and Stark, 1985) or increase their stock of home assets. The results from the Tobit also indicate that immigrants with plans to return home in the next five years are more likely to remit and to remit larger sums than their corresponding counterparts. This supports the idea that immigrants planning to return home need to maintain their “social capital” by supporting their families. Nonetheless, it can also indicate that these immigrants are “target savers” remitting with the goal of purchasing certain assets. In contrast, migrants with longer Spanish residencies, those with a tertiary education and those with a Spanish degree –a sign of assimilation into Spanish society– are less likely to remit and remit smaller euro amounts than migrants with shorter residencies, without a tertiary education or without a Spanish educational degree. This is also true of undocumented immigrants who appear less likely to remit and to remit less than legal immigrants.

As with personal characteristics, a few family descriptors appear to significantly drive migrants’ remitting behavior. For instance, family composition, as captured by the number of children residing in the Spanish household and the number of children living elsewhere, seem to curtail remittances. Surprisingly, children back home do not influence remittances either positively or negatively. However, migrants planning on bringing their families to Spain are 23 percentage points more likely to remit and remit an average of 463 more euros per year than their counterparts without that intention.

Finally, it is interesting that there are significant differences in migrants’ remitting behavior according to their regions of origin. American migrants (our reference category) are, as noted earlier, the ones more likely to remit and they remit larger sums back home. They are followed by Asian, African and, finally, European migrants.

Do migrant remittances respond to portfolio interests? The results suggest they do. First, higher GDP growth rates back home raise remittance flows. Specifically, a 1 percentage point increase in the per capita GDP growth rate differential between the home and Spain increases the probability of remitting by 2 percentage points and the yearly amount remitted by 32 euros. There is no reason for expecting higher growth rates back home to raise remittance flows by “altruistically-minded” remitters. Hence, this result suggests that remitters are responding to portfolio variables. Likewise, higher real interest rates in the home country relative to in Spain seem to support the notion that migrant remittances respond to portfolio-type variables. However, the effect is rather small and hardly economically significant.

Real exchange rate depreciations appear to discourage immigrants’ remitting. A doubling of the real exchange rate (real depreciation of 100 percent) lowers the likelihood of remitting by 14 percentage points and the amount remitted by 23 euros per year. If remitting is taking place with investment purposes in mind, the wealth effect is overriding the price effect. That is, the loss in value of assets held back home following the real exchange rate depreciation reduces the migrant’s wealth and remittance outflow despite the fact that it is now cheaper to invest in the home country. If, on the other hand, the remitting is taking place for altruistic reasons, such behavior is consistent with the notion that support of the family back home requires fewer euros due to the depreciation. While the exchange rate depreciation link is consistent with both altruistic and investment motives, the fact that uncertainty in the real exchange rate increases remittances does point to investment and asset accumulation as a driver of remittances. In this case, a one standard deviation increase in real exchange-rate uncertainty

raises the probability of remitting money home by 1.3 percentage points ( $0.17 \times 0.078$ ) and, among remitters, the euro amount remitted yearly by approximately 23 euros ( $0.17 \times 134.8$ ).<sup>7</sup>

In sum, the remitting behavior of Spanish immigrants conforms to what the literature has previously noted when it comes to personal and family characteristics of remitters. Yet, our findings also reveal that migrants respond both to exchange-rate uncertainty and to differential per capita GDP growth and real interest rates in ways that imply that remitters are responding to portfolio variables. This result suggests that migrants are not merely driven by altruistic motives when they send money back home, but also by the relative economic conditions, pointing to asset accumulation as an additional motivation for remitting along with sensitivity to relative conditions in terms of the geographic location of that asset accumulation .

#### **B) Evidence from Immigrants According to their Ownership of Home Country Assets**

In estimating the remitting functions described above, we are combining all immigrants – migrants who remit to support the family with migrants who remit for portfolio or investment reasons.<sup>8</sup> As noted earlier, these two immigrants may respond very differently to portfolio variables. Consider, for example, the real GDP growth rate differential. Altruistically-motivated remitters will more likely reduce their remittances when home country GDP growth rates rise, while the portfolio investor may instead increase remittances to take advantage of rising returns to investments back home. By combining these two types of remitters in our data, we are less likely to distinguish between these distinct responses and, thereby, less likely to identify the different motives for remitting. Hence, we separate immigrants according to whether they own assets back home. Immigrants who own assets back home are probably more likely to maintain

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<sup>7</sup> This figure is computed using the standard deviation of the volatility of the real exchange rate (0.17) and the marginal effect in question.

<sup>8</sup> Some remitters, of course, probably simultaneously do both -- remit to support family back home and remit for investment purposes.

a stronger interest in the home country and, as such, track more closely changes in market conditions at home *and* in Spain. We then examine if, indeed, remittance flows from owners of home country assets respond differently to variations in portfolio variables than the remittance flows from other immigrants.

The figures in Table 6 reveal that about one quarter of immigrants owns assets back home (2100 out of 8344). More than half of immigrants in this category remit home (1120 out of 2100) –a substantially greater fraction than immigrants who do not own home assets back home, for whom this fraction only reaches 28 percent (1750 out of 6244). More interesting are the differences in their responses to the portfolio variables. While both groups increase their remittances in response to differences in per capita GDP growth rates between the home country and Spain, the response of remittance flows from immigrants with home assets back home is considerably larger. A 1 percentage point increase in the difference in per capita GDP growth rates between the home country and Spain raises the probability of remitting by owners of home country assets by 1.6 percentage points –significantly more than among immigrants who do not own any home country assets for whom this figure is only 0.2 percentage points. Similarly, immigrants who own home country assets increase their remittances by 47 euros per year relative to their counterparts who do not own any home country assets, for whom the increase only amounts to 25 euros per year. We also find that a doubling of the real exchange rate (that is, a 100 percent depreciation of the home currency) reduces the probability of remitting among owners of home country assets by 34 percentage points, but only by 0.4 percentage points among immigrants who do not own any assets back home. Likewise, owners of home country assets would respond to the currency depreciation by reducing their remittances by nearly 1000 euros per year, whereas immigrants who do not own any assets back home would only reduce their

remittance flows by 104 euros per year. Finally, a 1 standard deviation increase in the uncertainty of the real exchange rate increases the probability of remitting by owners of home country assets by 3.5 percentage points ( $0.2498 \times 0.141$ ) and the amount remitted yearly by 103 euros ( $0.2498 \times 411.82$ ). However, real exchange rate uncertainty has no effect on the remitting patterns of immigrants who do not report ownership of home country assets.

These results seem to confirm that there are different classes of immigrants —some who remit and others who do not. Similarly, remitters seem to differ with regards to their motives. Some are swayed by portfolio variables, whereas others are not. Overall, the results suggest that, in order to best understand the remitting behavior of immigrants, we need to acknowledge the diversity of motives behind migration and, consequently, remitting patterns.

### **C) Evidence from Immigrants According to their Region of Origin**

We saw earlier that the characteristics of immigrants from different regions of the world differ. Perhaps this is because their reasons for migrating differ which, in turn, is likely to spill over into their motives for remitting. We attempt to see if, indeed, this is the case by estimating remitting equations for immigrants according to their regions of origin.<sup>9</sup> The results are displayed in Table 7. Because we are most interested in determining whether remitters are guided by portfolio interest and, if so, to what extent, we only display the results for the portfolio variables. Nevertheless, full results are available from the authors upon request.

Consistent with the portfolio motive for remitting, we find that real interest rate differentials, real exchange rate movements and the uncertainty of the real exchange rate all affect the remitting behavior of African immigrants. Specifically, a 1 percentage point increase in the real interest rate differential increases the proportion of African migrants who remit by 7

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<sup>9</sup> We do not present disaggregated results for Asia or Oceania due to the relatively small number of immigrants from those two continents.

percentage points and the amount they remit on a yearly basis by 119 euros. Additionally, a doubling of the real exchange rate reduces the proportion of African remitters by 21 percentage points and the amount they remit yearly by 97 euros. Finally, a one standard deviation increase in the uncertainty of the real exchange rate increases the probability of remitting among African immigrants by 13 percentage points ( $0.0066*20$ ) and the amount sent by 224 euros/year ( $0.0066*33955$ ).

Among American immigrants, remittances seem to decline with greater per capita GDP growth rates at home as well as with real exchange rate depreciations. These responses are in line with both portfolio and altruistic motives for remitting. However, the fact that remittances increase with real exchange rate uncertainty signals the presence of a portfolio motive among American remitters. Specifically, a 1 standard deviation increase in real exchange rate uncertainty (0.01) increases the probability of remitting among immigrants from the Americas by 2.6 percentage points ( $0.01*2.624$ ) and their yearly remittances by 84 euros ( $0.01*8414$ ). Therefore, just as with immigrants from Africa, the portfolio motive for remitting also appears to be present among immigrants from the Americas.

In contrast, this is not the case among Asian immigrants. None of the portfolio variables appear to significantly impact remittance flows in the direction expected in the presence of an investment motive. Rather, we find that Asian remittance outflows decrease with increases in the real interest rate differential between the home country and Spain. Perhaps this signals the presence of an altruistic motive for remitting. For instance, it could be that higher returns to investments back home are indicative to the migrant of an improved economic environment and a reduced need for help, leading to fewer remittance outflows. In any event, because the vast majority of immigrants in Spain –in excess of 95 percent– originate from the Americas, Europe



and Africa, the Asian sample is fairly small. Therefore, one should be extra cautious in making any inferences using such a small sample.

The bottom half of table 7 displays comparable results for Europe. We find that, in the aggregate, European immigrants do not respond to portfolio variables. However, if we split this group into two categories: immigrants originating from countries in Western Europe and those originating from countries in Eastern Europe, we get some interesting results. The remitting patterns of Eastern European immigrants are affected by two of the portfolio variables: per capita GDP growth and real interest rate differentials. A faster growing economy at home, just as higher returns at home, increase remittance flows. Yet, Eastern Europeans are not affected by real exchange rate movements or by real exchange rate uncertainty. This may be due to the fact that many of the Eastern European countries have been attempting to join the European Union and, in order to do so, need to limit exchange rate uncertainty. In any event, the results suggest that Eastern Europeans do have an investment motive for remitting. However, Western Europeans do not. The fact that immigrants from Western Europe do not seem to be remitting to take advantage of riskless or risky profit opportunities is, nevertheless, not surprising in a common market.

In sum, the results reveal that, for most immigrants – those from Africa, the Americas and Eastern Europe, the portfolio motive appear to be present in their remitting behavior. Nevertheless, there are interesting differences by continent of origin on the impact of portfolio variables on remitting patterns, which underscore the well-known diversity of motives for migrating and, consequently, for remitting according to immigrants' origins.

## **VII. Conclusions**

Migration takes place for many reasons. Some people migrate in search of better working opportunities. Some migrate to acquire human capital. Yet, others migrate in order to take advantage of asset accumulation opportunities. Many migrate to escape political or religious persecution or for family reunification purposes. Consequently, it should not come as a surprise that remittances –the earnings that immigrants send home– might also be sent for a plethora of motives. Using a database of Spanish immigrants, which includes immigrants from all across the globe, we conclude that migrants’ remittances are responding to an altruistic motive, but, in addition, to investment/portfolio interests.

Understanding the extent to which migrants remit money home in response to portfolio variables is of particular interest for a variety of reasons. For one, while there has been some evidence that remittances respond to portfolio variables, the evidence is scanty and contradictory. As noted earlier, the evidence is derived from aggregate remitting functions which cannot clearly inform on how portfolio variables affect remittances since they correlate multilateral inflows to multilateral portfolio variables. To examine whether and how portfolio variables affect remittances, we need to examine the relationship between bilateral flows with bilateral portfolio variables. We are able to do so in this study and, thereby, get more convincing evidence of the portfolio motive for remitting.

A second reason for striving to understand how portfolio variables affect remittance flows is to be able to forecast these flows. If remittances are motivated by portfolio conditions, they are unlikely to be as counter-cyclical as many believe. Hence, governments should not count on these inflows to prop up incomes during idiosyncratic downturns.

We find that the portfolio motive is present. Immigrants do seem to take into account relative economic conditions. Specifically, immigrants remit more when home per capita growth rates rise relative to those rates in Spain and when the home-host real interest rate differential increases. Furthermore, real exchange rate depreciations on the home currency seem to curtail remittances, whereas real exchange rate uncertainty increases them. In sum, economic conditions at home do influence remittance flows. Consequently, it is not that clear that remittances can be counted upon to stabilize the economy.

We also see that the remitting behavior and motives of immigrants differ according to their ownership of home country assets. This is also true when we distinguish immigrants according to their region of origin. African and American immigrants are sensitive to various portfolio variables, while Asian immigrants do not seem to be. That is also true of European immigrants when we do not distinguish between immigrants from Western as opposed to Eastern Europe. However, once we do, Eastern European immigrants appear responsive to some of the portfolio variables, whereas Western Europeans do not. Thus, portfolio variables do matter, but not uniformly across the globe.

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**Table 1: Characteristics of Immigrants by Continent of Origin**

<b>Variables</b>	<b>All</b>	<b>Africa</b>	<b>Americas</b>	<b>Asia</b>	<b>Europe</b>
Male	0.45	0.57	0.40	0.57	0.44
Age	39.17	38.71	37.50	39.29	41.07
Time in Spain	13.18	15.09	10.61	13.58	14.89
Fluent in Spanish	0.65	0.34	0.96	0.28	0.48
Primary Education or Less	0.19	0.35	0.18	0.23	0.16
Secondary Education	0.57	0.52	0.57	0.47	0.59
Tertiary Education	0.23	0.12	0.25	0.31	0.25
Spanish Educational Degree	0.28	0.19	0.29	0.19	0.31
Married	0.54	0.64	0.48	0.63	0.55
Children in the HH	0.61	0.81	0.60	0.74	0.53
Children in Home Country	0.20	0.29	0.18	0.16	0.19
Children Elsewhere	0.02	0.02	0.02	0.01	0.02
Employed	0.64	0.53	0.70	0.71	0.61
Undocumented	0.08	0.09	0.17	0.05	0.01
HC Asset Ownership	0.25	0.20	0.28	0.32	0.25
Plans on Returning Home	0.07	0.03	0.10	0.06	0.05
Plans on Bringing the Family	0.25	0.40	0.31	0.34	0.11
Number	15465	2475	6296	429	6094

**Table 2: Remittances by Continent of Origin**

<b>Area of Origin</b>	<b>Number of Observations</b>	<b>Proportion Who Remits</b>	<b>Amount Remitted in euros (last year)<sup>a</sup></b>
All Immigrants	15465	0.37	1868
Africa	2475	0.40	1443
America	6296	0.48	2103
Asia	429	0.45	2121
Europe	6094	0.23	1638

**Notes:** (a) Average amount remitted conditional on remitting a positive sum last year.

**Table 3: Characteristics of Remitters by Continent of Origin<sup>a</sup>**

	Africa	Americas	Asia	Europe
Male	0.73	0.38	0.58	0.45
Age	34.70	35.72	37.34	35.09
Time in Spain	8.49	6.27	10.93	5.20
Fluent in Spanish	0.23	0.97	0.22	0.36
Primary Education or Less	0.37	0.20	0.24	0.13
Secondary Education	0.51	0.62	0.51	0.69
Tertiary Education	0.11	0.18	0.24	0.18
Spanish Educational Degree	0.07	0.13	0.12	0.09
Married	0.65	0.47	0.67	0.55
Children in the HH	0.60	0.54	0.69	0.43
Children in Home Country	0.06	0.10	0.04	0.08
Children Elsewhere	0.01	0.03	0.01	0.01
Employed	0.71	0.80	0.84	0.78
Undocumented	0.07	0.15	0.04	0.02
HC Asset Ownership	0.29	0.35	0.44	0.48
Plans on Returning Home	0.04	0.15	0.08	0.10
Plans on Bringing the Family	0.68	0.52	0.57	0.30
N	996	3022	193	1425

**Table 4: Macroeconomic Conditions in the Continent of Origin and in Spain, 2006**

Macroeconomic Conditions	Africa	Americas	Asia	Europe	Spain
Real Exchange Rate Depreciation (monthly average)	1.78E-03	0.06	-0.01	-0.01	NA
Real Exchange Rate Uncertainty	0.01	0.03	0.12	0.06	NA
Inflation Rate (in %)	3.63	5.59	5.45	0.06	0.03
Nominal Deposit Interest Rate (in %)	4.14	5.99	5.51	3.64	2.37
Per Capita GDP Growth Rate	5.51	4.95	6.27	4.22	2.16

**Notes:** The exchange rate is defined as home currency units per euro. Hence, a rise indicated depreciation for the home currency or appreciation of the Euro. See appendix for details about the measurement of real exchange rate changes.

**Table 5: Tobit Model of the Euro Amount Remitted Yearly by All Immigrants**

Variables	Euro Amount Remitted Yearly			
	Coefficient	S.E.	M.E. on Prob (Y>0)	M.E. on E(Y Y>0)
Male	121.840*	71.410	0.016	27.230
Age	8.396**	3.791	0.001	1.870
Time in Spain	-51.576***	17.009	-0.007	-11.486
Time in Spain Squared	-0.732	0.512	-9.37E-05	-0.163
Fluent in Spanish	62.287	96.173	0.008	13.815
Secondary Education	113.158	88.672	0.014	25.063
Tertiary Education	-379.371***	116.901	-0.047	-79.377
Spanish Educational Degree	-973.533***	105.253	-0.115	-192.066
Married	126.830*	73.977	0.016	28.187
Children in the HH	-301.770***	43.069	-0.039	-67.207
Children in Home Country	-118.731	96.861	-0.015	-26.442
Children Elsewhere	-444.541**	201.383	-0.057	-99.003
Employed	1162.115***	81.611	0.139	235.638
Undocumented	-297.446**	130.503	-0.036	-61.491
HC Asset Ownership	964.818***	76.698	0.132	246.833
Plans on Returning Home	1011.710***	114.926	0.146	286.700
Plans on Bringing the Family	1632.037***	76.773	0.233	462.554
Africa	-873.102***	135.636	-0.099	-159.845
Asia	-816.356***	232.640	-0.091	-144.572
Europe	-1697.562***	110.189	-0.222	-409.216
<b>Per capita GDP Difference</b>	<b>145.121***</b>	<b>14.541</b>	<b>0.019</b>	<b>32.320</b>
<b>Real Interest Rate Difference</b>	<b>20.315*</b>	<b>10.987</b>	<b>0.003</b>	<b>4.524</b>
<b>Real Exchange Rate Depreciation</b>	<b>-1074.368***</b>	<b>256.540</b>	<b>-0.138</b>	<b>-239.270</b>
<b>Uncertainty of Real Exchange Rate</b>	<b>605.600***</b>	<b>185.776</b>	<b>0.078</b>	<b>134.872</b>
No. of Observations:		8364		
Uncensored Observations (in Tobit Model)		2870		
LR Chi-square		3556.18		
Prob > Chi-square		0.000		

**Notes:** \*\*\*Significant at the 1 percent level or better, \*\*significant at 5 percent level or better and \*significant at the 10 percent level or better. Regressions include a constant term and region dummies. We use immigrants from America as the reference category.

**Table 6: Tobit Models for the Euro Amount Remitted Yearly by Immigrants According to their Ownership of Home Country Assets**

Variables	Does Not Own Home Country Assets				Owns Home Country Assets			
	Coefficient	S.E.	M.E. on Prob (Y>0)	M.E. on E(Y Y>0)	Coefficient	S.E.	M.E. on Prob (Y>0)	M.E. on E(Y Y>0)
Male	56.334	82.615	0.006	9.057	272.495**	132.964	0.043	125.343
Age	11.011**	4.553	0.001	1.767	0.836	6.659	1.31E-04	0.383
Time in Spain	-83.363***	17.736	-0.011	-13.375	116.541***	43.854	0.018	53.381
Time in Spain Squared	0.356	0.479	5.65E-05	0.057	-7.464***	1.859	-0.001	-3.419
Fluent in Spanish	121.429	111.287	0.010	19.264	18.469	179.413	0.003	8.456
Secondary Education	150.252	100.871	0.017	23.873	-26.654	170.791	-0.004	-12.215
Tertiary Education	-188.240	138.233	-0.017	-29.042	-781.478***	211.086	-0.121	-333.712
Spanish Educational Degree	-1084.571***	121.155	-0.100	-154.170	-481.626**	203.964	-0.075	-207.375
Married	104.501	85.619	0.007	16.777	90.022	138.115	0.014	41.059
Children in the HH	-255.199***	52.332	-0.030	-40.946	-393.670***	73.643	-0.062	-180.319
Children in Home Country	14.654	121.709	0.004	2.351	-263.679*	155.381	-0.041	-120.777
Children Elsewhere	-254.330	285.050	-0.023	-40.807	-487.025*	286.906	-0.076	-223.080
Employed	1135.490***	92.931	0.118	166.440	1116.596***	157.669	0.171	470.435
Undocumented	-374.027***	147.671	-0.050	-53.525	67.874	253.392	0.011	31.398
Plans on Returning Home	1090.739***	142.579	0.227	243.763	903.806***	189.899	0.142	462.380
Plans on Bringing the Family	1631.349***	88.900	-0.076	363.660	1562.312***	141.835	0.243	783.227
Africa	-832.331***	149.165	-0.065	-107.201	-989.945***	284.676	-0.150	-391.350
Asia	-657.544**	270.451	-0.203	-84.359	-941.529**	428.729	-0.142	-366.845
Europe	-1699.589***	125.699	0.017	-309.767	-1447.815***	212.975	-0.224	-666.127
<b>Per capita GDP Difference</b>	<b>153.801***</b>	<b>16.811</b>	<b>0.002</b>	<b>24.677</b>	<b>103.347***</b>	<b>27.625</b>	<b>0.016</b>	<b>47.338</b>
<b>Real Interest Rate Difference</b>	<b>14.248</b>	<b>12.430</b>	<b>-0.075</b>	<b>2.286</b>	<b>25.611</b>	<b>21.190</b>	<b>0.004</b>	<b>11.731</b>
<b>Real Exchange Rate Depreciation</b>	<b>-645.959**</b>	<b>280.020</b>	<b>0.004</b>	<b>-103.643</b>	<b>-2174.214***</b>	<b>647.566</b>	<b>-0.341</b>	<b>-995.891</b>
<b>Uncertainty of Real Exchange Rate</b>	<b>-114.716</b>	<b>307.435</b>	<b>0.006</b>	<b>-18.406</b>	<b>899.082***</b>	<b>258.715</b>	<b>0.141</b>	<b>411.821</b>
No. of Observations:		6244				2100		
Uncensored Observations		1750				1120		
LR Chi-square		2541.38				656.84		
Prob > Chi-square		0.000				0.000		

**Notes:** \*\*\*Significant at the 1 percent level or better, \*\*significant at 5 percent level or better and \*significant at the 10 percent level or better. Regressions include a constant term and region dummies.



**Table 7: Tobit Models for the Euro Amount Remitted Yearly by Immigrants by Continent/Region of Origin**

Independent Variables	Africa		Americas		Asia	
	M.E. on P(Y>0)	M.E. on E(Y Y>0)	M.E. on P(Y>0)	M.E. on E(Y Y>0)	M.E. on P(Y>0)	M.E. on E(Y Y>0)
Per capita GDP Difference	0.019	31.731	-0.021***	-67.569***	-0.018	-35.276
Real Interest Rate Difference	0.071***	119.181***	0.000	0.274	-0.058***	-113.975***
Real Exchange Rate Depreciation	-0.207***	-96.939***	-0.216***	-692.757***	-0.131	-256.400
Uncertainty of Real Exchange Rate	20.138***	33954.8***	2.624***	8413.691***	0.257	503.952
No. of Observations	927		2569		170	
Uncensored Obs.	405		1480		82	
LR Chi-Square	311.68		758.23		100.31	
Prob > Chi-Square	0.000		0.000		0.000	
Independent Variables	Europe		Western Europe		Eastern Europe	
	M.E. on P(Y>0)	M.E. on E(Y Y>0)	M.E. on P(Y>0)	M.E. on P(Y>0)	M.E. on E(Y Y>0)	M.E. on P(Y>0)
Per capita GDP Difference	0.001	1.403	-0.003	-4.922	0.027**	61.509**
Real Interest Rate Difference	0.002	3.013	-0.006	-9.215	0.013*	30.879*
Real Exchange Rate Depreciation	-0.184	-225.710	-2.190	-3645.463	-0.408	-943.015
Uncertainty of Real Exchange Rate	0.006	7.591	0.698	1162.038	0.003	6.610
Western Europe	0.013***	-308.071***	-	-	-	-
No. of Observations	4694		3004		1690	
Uncensored Obs.	903		75		828	
LR Chi-Square	1733.99		154.55		297.61	
Prob > Chi-Square	0.000		0.000		0.000	

**Notes:** For the sake of simplicity, we display the marginal effects being interpreted. Full regression results, including coefficients and standard errors, are available from the authors. \*\*\*Significant at the 1 percent level or better, \*\*significant at 5 percent level or better and \*significant at the 10 percent level or better. Regressions include a constant term and all other regressors in Table 5. All of the marginal effects are evaluated at the country mean except for Africa, in which case real exchange rate depreciation of 3 percent was assumed (a global mean).

**APPENDIX TABLES**

**Table A: Variable Names and Definition**

<b>Variable Names</b>	<b>Definition</b>
Likelihood of Remitting	Migrant remits money home
Euro Amount Remitted Yearly	Euro amount remitted last year if they remitted money home
<i>Independent Variables</i>	
Male	Respondent's gender dummy
Age	Respondent's age
Time in Spain	Years in Spain
Time in Spain Squared	Years in Spain squared
Fluent in Spanish	Migrant is fluent in Spanish
No Education	Migrant has no education
Primary Education	Migrant has a primary school education
Secondary Education	Migrant has a secondary school education
Tertiary Education	Migrant has purchased university studies
Spanish Educational Degree	Migrant has a Spanish academic degree
Employed	Employment status dummy
Undocumented	Legal status dummy
HC Asset Ownership	Migrant owns assets (housing, land, cattle, business, autos) in home country
Plans on Returning Home	Migrants plans on returning to her/his home country in the next five years
Married	Respondent's marital status dummy
Children in the HH	Number of children in the household
Children Outside Spain	Number of children outside Spain
Plans on Bringing the Family	Migrant intends to bring some family members to Spain
Africa	Respondent's continent of birth
America	Respondent's continent of birth
Asia	Respondent's continent of birth
Europe	Respondent's continent of birth
Per capita GDP Difference	Difference in per capita GDP between home and host country during 2006
Real Interest Rate Difference	Difference in real interest rates between home and host countries for 2006
Real Exchange Rate Depreciation	Average of monthly real exchange rate depreciations during 2006
Uncertainty of Real Exchange Rate	Standard deviation of monthly real exchange rate depreciations during 2006
Western Europe	Respondent originates from one of the countries in Western Europe entering the EU before 2004

**Table B: Means and Standard Deviations of Variables Used in the Analysis**

<b>Variable Names</b>	<b>Mean</b>	<b>S.D.</b>
Likelihood of Remitting	0.37	0.48
Euro Amount Remitted (if they remitted)	1868.14	2275.35
<i>Independent Variables</i>		
Male	0.45	0.50
Age	39.17	14.30
Time in Spain	13.18	14.54
Fluent in Spanish	0.65	0.48
Primary Education or Less	0.19	0.39
Secondary Education	0.57	0.49
Tertiary Education	0.23	0.42
Spanish Educational Degree	0.28	0.45
Married	0.54	0.50
Children in the HH	0.61	0.95
Children in Home Country	0.20	0.70
Children Elsewhere	0.02	0.19
Employed	0.64	0.48
Undocumented	0.08	0.27
HC Asset Ownership	0.25	0.43
Plans on Returning Home	0.07	0.25
Plans on Bringing the Family	0.25	0.43
Africa	0.16	0.37
Asia	0.03	0.16
America	0.41	0.49
Europe	0.39	0.49
Per capita GDP Difference	2.62	2.75
Real Interest Rate Difference	-0.70	8.33
Real Exchange Rate Depreciation	0.02	0.22
Uncertainty of Real Exchange Rate	0.04	0.16
Western Europe	0.24	0.43

## DATA APPENDIX

### Derivation and data sources for the macroeconomic variables used in the analysis

**1. Real interest rate differentials:** Deposit interest rates come from International Financial statistics (variable 60L..zf). If the deposit rate is not reported by IFS Statistics, a similar interest rate variable is used in its place. Inflation rates are subtracted from the nominal interest rate to obtain real interest rates. Inflation rates are constructed from the CPI index (line 64..zf), when available, or from a close substitute when unavailable.

**2. Real per capital growth differentials:** Real per capita GDP growth rates for 2006 for the individual countries come from World Development Indicators online.

**3. Real exchange rate depreciation:** Real exchange rates are constructed from nominal exchange rates and price indexes extracted from IFS statistics. The nominal exchange rate is from line WA.ZF or AA.ZF the CPI from line 64..zf. The real exchange rate is constructed for each month in 2006 as:

$$Real\ Exchange\ Rate_t = \frac{e_{home\ currency/euro} \times P_{Spain}}{P_{home\ country}}$$

where  $e$  represents the nominal exchange rate and  $P$  the CPI index. The home currency depreciation rate is defined for each month as follows:

$$Real\ exchange\ rate\ depreciation_t = \log(real_t) - \log(real_{t-1})$$

Monthly real exchange depreciation rates are averaged for any given year to derive the yearly average real exchange depreciation rate.

**4. Real exchange rate uncertainty:** The standard deviation of the monthly log differenced real exchange rates is computed to derive a measure of yearly real exchange rate uncertainty.