Conferencia Interamericana de Seguridad Social

Centro Interamericano de Estudios de Seguridad Social

VOL. 2 NUM. 2 SECOND SEMESTER 2006

Well-being and Social Policy

Migration
Guest Editor
Alejandra Cox-Edwards

CISS

UNIVERSIDAD IBEROAMERICANA

WELL-BEING AND SOCIAL POLICY
VOL 2, NUM. 2, pp. 67-88

WORKERS' REMITTANCES AND CURRENCY CRISES

Alketa Hysenbegasi
Department of Finance and Economics
Baruch College, CUNY
alketa.hysenbegasi@baruch.cuny.edu

Susan Pozo
Department of Economics, Western Michigan University
susan.pozo@wmich.edu

Abstract

We seek to further understand the factors that determine per emigrant remittances using data from 23 Latin American and Caribbean countries over the 1980-2003 period. We find that emigrants avoid remitting when the exchange rate is under pressure. This finding is consistent with the notion that remitters strive to reduce their exposure to exchange rate losses by taking into account the expected future value of current flows to the home country. Such a finding is important because it implies that remittances are not necessarily a stable source of external finance. Our result is robust to corrections for endogeneity with respect to the exchange rate variable. We also find that geography in the form of distance helps predict the flow of per emigrant remittances.

Key words: workers' remittances; emigrants, currency crisis.
Classification JEL: F22, F24.

Introduction

Workers' remittances—the repatriated earnings of emigrants—has attracted more attention in recent years as many nations appear to depend more on these flows. The greater reliance on these private transfers may be the result of greater stocks of expatriate workers or to the declining propensities of industrialized nations to extend aid via public transfers. In fact some scholars are making the claim that foreign exchange inflows from remittances are a preferable source of foreign exchange. They are claimed to be more reliable than traditional capital inflows, because of their presumed lower sensitivity to macroeconomic events (Ratha, 2004). In this paper

we examine and evaluate the proposition that workers remittances can provide a stable flow of foreign exchange resources.

To understand remittances, it is helpful to gain insights about the underlying motives of emigrants, the set of individuals from whom these flows originate. Are these money flows taking place because emigrants feel charitable toward their stay-at-home kin? Are the money flows the result of family risk-sharing strategies? Are emigrants simply building stocks of assets in home communities in anticipation of an eventual return? A fair amount of microeconomic research has been undertaken to answer these questions. Models of migration and the family have been developed and empirical testing of these models are widely available. The papers by Lucas and Stark (1985), Stark and Lucas (1988) Agarwal and Horowitz (2002), and De la Briére, et al (2002) serve as a representative sample of this line of research with some of these studies supporting an altruistic motive with respect to the sending of money home, while evidence of self-interest is found in others.

In macroeconomic studies of remittances, the same general themes—altruism and self-interest—are present. Keely and Tran (1989), Haque et al. (1994), and Faini (1994) argue that remittances are sent for altruistic purposes, serving to absorb economic shocks and to soften the blows of general economic downturns. Other studies, alternatively, view remittances as one component of an overall strategy used by economic agents to construct portfolios of investments that will optimize current and future income flows[1] (El-Sakka and McNabb, 1999). That is, immigrant workers are assumed to consider relative rates of return when investing in the home and host countries and are assumed to allocate their assets accordingly. A consequence is that government policies that impact on the relative returns to remitting may alter remittances flows and the levels of foreign exchange resources available to policymakers as emigrant workers vary the levels of their transfers back home (Wahba, 1991).

The main contribution of this paper is to take a closer look at the determinants of remittances from a macroeconomic perspective. We re-examine to what extent remittances respond to the external macroeconomic conditions of the recipient nation and we evaluate the notion that remittances can be relied upon during periods of economic turmoil. Do emigrants contribute toward the stabilization of foreign exchange inflows by remitting more when economies are most in need of supplemental resources? We find that the macroeconomic pattern of remittance flows is consistent with the idea that remitters appear to care about the expected future value of these flows, remitting less when it is anticipated that the dollar value of those flows will deteriorate. An important implication of this behavior is that rather than serving to smooth economic activity, the timing of remittances can be destabilizing. These findings are borne out, in part by the use of an international macroeconomic variable—exchange market pressure (*EMP*)— that allows us to observe the response, by remitters not only to changes in current flow variables, but also to changes in the expected value of moneys remitted home.

[1] Investment includes not only portfolio investment, but housing investment, small businesses and informal business investment, and investment in human capital accumulation. In reality, capital investment flows from immigrants to their home countries should be tracked in the financial account of the balance of payments. However, the immigrant investor whose investments are "managed" by friends and family at home is often engaging in "informal investment" and these flows are more likely to be categorized as remittances rather than as financial account transactions.

1. Overview of Remittances

In Table 1 the ratio of remittances to GDP during 1993 is compared with the ratio observed a decade later for the sample of countries examined in this study. While in many cases dependence on remittances appears to have fallen, in a good number of cases remittances as a proportion of GDP has grown substantially. It is noteworthy that in 2003 remittances to the Dominican Republic, El Salvador, Haiti, Honduras, Jamaica and Nicaragua accounted for more than 10% of GDP, while in Grenada and Guatemala they accounted for more than 5% of GDP. Surprisingly, Mexico, a relatively large country in the region with a reputation of high emigration rates, is characterized with a relatively low percentage of (recorded) remittances to GDP (2.33 percent) in 2003.

According to the results displayed in Table 2, remittances exceeded foreign exchange earnings from the exports of goods and services in Haiti in 2003. In Jamaica, foreign exchange earnings from remittances were on par with earnings from the exports of goods. These high inflows are consistent with the hypothesis that remittances play a very important role in the economies of many countries including many represented in this study.

Table 1
Workers' Remittances as a Percentage of GDP

Country	1993	2003
Antigua and Barbuda	0.88	1.45
Argentina	0.02	0.19
Barbados	2.68	4.30
Belize	3.03	1.72
Bolivia	0.07	1.60
Brazil	0.28	0.57
Colombia	0.84	3.91
Dominica	1.99	1.54
Dominican Republic	7.77	14.06
El Salvador	11.43	14.26
Grenada	3.19	5.23
Guatemala	2.11	8.68
Haiti	4.22	27.76
Honduras	1.83	12.42
Jamaica	4.95	17.16
Mexico	0.99	2.33
Nicaragua	1.42	10.75
Panama	1.50	0.66
Peru	0.83	1.42
St. Kitts and Nevis	1.01	1.16
St. Lucia	4.06	0.58
St. Vincent and Grenadines	0.84	0.81
Trinidad and Tobago	0.44	0.75

Sources and Notes: GDP and workers' remittances are from *World Development Indicators CD*.

Table 2
Workers' Remittances as a Percentage of Goods Exports and as a Percentage of Goods and Services Exports 2003

Country	Goods exports	Goods and services exports
Antigua and Barbuda	0.25	2.52
Argentina	0.86	0.75
Barbados	42.77	7.90
Belize	5.37	3.21
Bolivia	8.00	6.73
Brazil	3.86	3.37
Colombia	22.46	19.75
Dominica	9.32	3.54
Dominican Republic	42.74	26.20
El Salvador	67.10	53.23
Grenada	54.78	13.81
Guatemala	70.43	52.27
Haiti	243.42	172.85
Honduras	41.72	32.66
Jamaica	100.89	39.74
Mexico	8.85	8.22
Nicaragua	41.84	33.81
Panama	1.68	1.11
Peru	9.57	8.06
St. Kitts and Nevis	6.21	3.36
St. Lucia	5.72	1.00
St. Vincent and Grenadines	7.42	1.69
Trinidad and Tobago	2.02	1.34

Source and Notes: Workers' remittances, exports and exports of goods and services were obtained from *World Development Indicators*.

In this paper we attempt to gain a better understanding of the factors that drive remittances inflows by tracking remittances over time using a panel of 23 Latin American and Caribbean nations. These 23 nations are the countries in the region for which the data necessary to undertake the analysis were available for the period under consideration. This is not to deny that in many other regions of the world remittances are sizable and of great interest (Straubhaar 1986, Adams 1993, Faini 1994, Glytsos 1997, and Ildahi and Jafarey 1999). Our investigation is limited, however, to remittances received in the Latin American and Caribbean areas due to our specialized data needs.

Our study is differentiated from others that have studied remittances from a macroeconomic perspective in at least three ways. First, whereas most studies examine remittances with respect to only one or two countries (e.g. El-Sakka and McNabb (1999); Lianos (1997) ; Glytsos (1997)), we employ information across twenty-three countries. We use panel methods to take advantage of behavior both over time and across countries. To date there are only a few multicountry macroeconomic studies of remittances. These include the studies by Faini (1994) who pools data from 5 Mediterranean countries, Hunte (2004) who studies 18 countries from the 1983 to the 2001 period, Chami, et al. (2005) who use a pool of 113 countries and Vargas-Silva and Huang (2006) who analyze remittances to 5 Latin American nations.

A second, distinguishing feature of our study is with respect to the aggregate remittance inflow variable that we track. Our dependent variable is per-emigrant remittances. In many other macroeconomic time series studies of remittances, the total flow of money home is examined without taking into consideration that the stock of emigrants will likely significantly impact the total volume of those flows. An increase in the number of migrants in the destination community is likely to lead to an increase in aggregate flows. By using a per-emigrant variable, we are in effect controlling for "potential flows" and can thereby obtain information on the behavior of emigrants[2].

To construct per emigrant remittance inflow we make at least one heroic assumption—that the potential pool of remitters for the countries we use in the study all reside in the United States. This allows us to simply consult U.S. census and immigration data (which specify the country-of-origin of all immigrants) to construct series of immigrants from the 23 countries in this study. We then divide the inflow of remittances by the number of immigrants obtained through our tabulations of U.S. immigration and census data. This provides us with per-emigrant remittance inflows in each year for each country in our sample.

We further distinguish our study in a third dimension—by focusing on the response of remittances to exchange market pressure, an international composite macroeconomic variable that allows us to measure the probability of currency crisis[3]. The higher is the probability of currency crisis the lower is the expected value (in dollars) of moneys sent today. While there are a number of macroeconomic studies that attempt to measure and discern how migrants respond to a series of macroeconomic variables, the modeling strategy is sometimes problematic. Many of the macroeconomic series that are used (e.g. exchange-rate movements, interest-rate differentials, inflation rates) are highly correlated with one another making it difficult to distinguish the impact of one or another of these variables on remittances. We dispense with this problem by using a composite variable that measures when countries are under threat of currency crisis.

Our strategy is to allow exchange market pressure to capture the probability that the remittance receiving nations will experience a currency crisis, diminishing the dollar value of transfers that have been converted into local currency. Why should the dollar value of remittances that have been converted into local currency be a variable of consideration? We argue that senders will be concerned with the exchange value of their transfers whether these transfers are made to fulfill altruistic deeds or investment goals. For example, take the case of an altruistic transfer. If the sender believes that there is going to be a large depreciation of the "peso" then it makes sense to delay the transfer until that event has taken place. Depreciations are often concurrent with rapid increases in domestic inflation. Delaying the transfer until the exchange of dollars for pesos is more favorable will diminish the erosion of purchasing power that accompanies depreciation. Hence, in the interest of maximizing the real value of transfers remitters will wait until the exchange markets have stabilized. In the case of an "investment" transfer, it is reasonable to expect that senders will continue to time their flows to macroeconomic events. If the senders' objectives is to build up their own stocks of capital, land and property in the remittance receiving nation, the

[2] Lianos's study of Greek migrants does model per-emigrant remittances, as does the paper by Glytsos (1997).
[3] El-Sakka (2004) uses the black market premium in his study of remittances to Jordan—which may also serve as a proxy for macroeconomic "stresses" on an economy. However, black market foreign currency markets are not universal. Hence usage of black market exchange rates as a proxy for foreign exchange market stresses is limited to countries with such markets.

timing of flows can significantly impact the values of the transfers. The same dollar amount will buy more assets in local currency if one waits until after crisis periods have passed . More pesos are acquired per dollar and, in addition, "fire sales" may be available.[4] Hence under two accounts: whether the migrant is behaving altruistically or is simply seeking to increase his/her stock of assets back home, we argue that increases in the probability of crisis will delay the timing of transfers.

There are several reasons for believing that our panel of Latin American and Caribbean countries is optimal for this investigation. First, given the relative sizes and variability of remittance flows to this region, it may be easier to statistically capture the macroeconomic influences on the flows. Second, many of these nations have experienced large changes in the probability of currency crises. Since we are interested in the effects of anticipated crises on remittances flows, these represent a good group of countries upon which to test our hypothesis. Third, we view it as somewhat reasonable to make the assumption that the bulk of emigrants from these countries have migrated to the U.S. Since we use U.S. census and immigration data to tabulate per emigrant remittances, it is important that this final assumption be valid.

2. Modeling and Empirical Estimation of Remittances Flows

One of the more puzzling results in the remittances literature is the fickleness of the effect of home country income on the level of remittances. While some studies find that remittances are prompted by declines in home family income and hence conclude that immigrants behave altruistically toward their family members back home, an almost equally large number of studies do not find evidence of this relationship and instead find behavior consistent with the self-interest motive. One possible reason for these inconsistent findings is that prior studies have not done well to control for other home and host variables that impact on the flows[5].

We suggest controlling for the future expected dollar value of transfers when assessing how home country economic conditions impact remittances. We essentially argue that altruistically motivated remitters watch over the "bottom line" of their transfers much in the same way as an investor. Remitters shy away from transferring resources when the probability is high that the resources will be diminished (in dollar terms) through exchange-rate depreciations. That is, remitters respond to the future expected value of current transfers. Transfers decrease when it is likely that the dollar value of those flows will be reduced. One overall interpretation of this result is that the emigrant maximizes the "good-will" she or he is apt to earn from transfer of resources by holding back when the dollar value of the flows are likely to be diminished while maintaining flows when the dollar value is likely to be stable or rising. In some respects the emigrant is behaving paternalistically, preserving the value of the flows via their timing. If the transfers are investment driven, this time pattern in flows is in accordance with maximizing the stock of assets in the home community.

[4] Of course, in an officially (or unofficially) dollarized economy real assets will be denominated in U.S. dollars and hence not vary with official depreciation. However, during crisis periods it is still the case that the prices of real assets are likely to fall, perhaps temporarily, as domestic owner of these assets attempt to deal with liquidity shortfalls. That is, "fire sale" bargain prices may be available following crisis periods.

[5] It is interesting that variance decompositions by Vargas-Silva and Huang (2006) reveal that host country economic conditions explain more of the variation in remittances than do home country economic variables.

Interesting policy conclusions arise from our findings. During currency crisis periods, economies are subject to especially trying economic conditions, during which time the external flows of funds in the form of remittances would be especially helpful. Foreign currency resources received at this time could help stabilize the macro-economy, while at the same time benefiting individual families who are likely to be affected by the economic downturns that generally coincide with currency crises. However, if the immigrant worker is also a rational agent, optimizing according to relative rates of returns (as in exchanging U.S. dollars into local currency), sending remittances when exchange regimes are in the process of or are predicted to collapse is less likely to take place. The remitter is more likely to hold back all or some of the payments and resume the flows when the conversion into home country goods, services and investments will be higher yielding. It is this relationship that we test for in this paper. By measuring how remittances respond to the likelihood of a currency crisis we obtain information on the notion that remitters are cognizant and responsive to the future expected values of dollar flows in local currency. Understanding this relationship helps us consider the various impacts that remittances can have on receiving economies.

2.1 Measuring the probability of currency crises

In what follows, we attempt to systematically capture the response of remittances to the probability of currency crisis. We hypothesize that remitters are acting as rational economic agents, by considering the expected dollar values of flows, by comparing pre-depreciation transfers to post-depreciation transfers. Overall, the emigrant will find that it pays to delay the transfer if the likelihood of depreciation increases.

To test our hypothesis that the expected value of the transfer in local currency will affect remittances flows we need a variable that will account for variations in the probability that a currency crisis will take place. To this end we use a procedure introduced by Eichengreen, Rose and Wyplosz (1995). We construct a measure of speculative pressure using a weighted average of exchange-rate and international reserve changes. The reason for this composite variable is that two factors go into play in signaling that an economy is likely to experience or is in the midst of experiencing currency crises. One factor is the exchange rate. Nominal exchange rate depreciations are the most obvious signal that the market has lost faith in the value of a currency. But governments do have other means of preventing (or delaying) depreciations of the currency. They can support the currency by supplying the market with its holding of international reserves.[6] Hence, if the exchange rate is stable, but we note that the central bank is drawing down its stock of international reserves, we have evidence that the currency is "under pressure". We need to account for the two variables, and hence the construction of a composite exchange market pressure variable, a la Eichengreen, et al. (1995) is in order.

The exchange market pressure (EMP) index is formally constructed as follows:

$$EMP_{jtq} = (\%\Delta e / \sigma_{\%\Delta e})_{jtq} - (\%\Delta IR / \sigma_{\%\Delta IR})_{jtq} \quad (1)$$

[6] Governments can also attempt to support the currency by manipulating relative interest rate differentials. For many countries however, this option is unavailable given the use of the domestic interest rate as a policy tool for other objectives. In said case, the interest rates that prevail are not reflective of and are inconsistent with actual credit conditions in the macroeconomy.

where j represents the country, q the respective quarter, and t the year. The first term on the right hand side of the equation is the percentage change in the exchange rate divided by its own standard deviation.[7] The second term is the percentage change in international reserves divided by its standard deviation. Currency pressures are directly felt when there is depreciation in the nominal exchange rate (a rise in e). Currency pressures decline, however, with increases in international reserves. Therefore we include a negative sign before the international reserve term to properly construct a variable that tracks pressures on the currency, with increased pressures taking place as *e* rises or as *IR* falls. In order to allow both exchange rate movements and international reserve changes to contribute equally (in relation to their relative volatilities) to the speculative pressure index, we weigh each component by the inverse of its standard deviation.

The value of EMP_{jtq} measures the severity of exchange market pressures. If there is no change in the nominal exchange rate and the central bank is not supplying international reserves to the market the value for EMP_{jtq} will be zero indicating no pressure on the currency. If there is minimal movement in the exchange rate and/or the central bank is using only a small portion of its international reserves to prop up the currency, the value for EMP_{jtq} will be small indicating that there is a small probability of crisis. If the movement in the exchange rate is large and/or the central bank is using large sums of its international reserves in an attempt to stabilize the exchange markets, the potential for currency crisis is large and will be reflected in a large value for EMP_{jtq}. The value for EMP_{jtq} thus reflects the severity of exchange market pressures and can therefore serve as a proxy to the expected value of transfers. If EMP_{jtq} takes on a large value, the expected value of transfers will fall, presumably reducing incentives to transfer moneys at this time. Given that the remittance variables are at the annual frequency we allow the maximum value for EMP_{jtq} over the year to serve as the probability of currency crisis during the year:

$$EMP_{jt} = \max \{ EMP_{jtq} \text{ for } q = 1,2,3,4\} \quad (2)$$

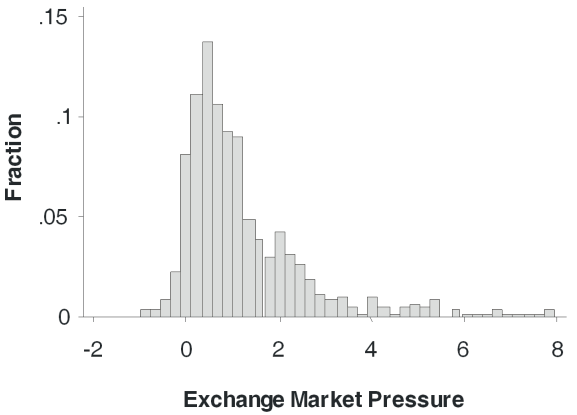
In Figure 1 we display the plot of the empirical distribution of *EMP*. (Since *EMP* has a very long tail, for expositional purposes only, we truncated the upper 5% of observations. These extreme values are retained, however, in the statistical analysis). Most observations display positive exchange market pressure with most observations clustered between 0 and 3. There are, however, a significant number of more extreme positive observations, indicative of situations where countries' exchange markets are under considerable pressure.

In addition to the above described continuous exchange market pressure variable, we use the series to identify periods of currency crisis. We define crisis to take place if the EMP index exceeds its mean value by 2 standard deviations.[8] Because our data for this analysis are annually aggregated, we create an annual dummy variable from the quarterly series to serve as the currency crisis variable.

[7] For countries with a perfectly fixed exchange rate the percentage change in the exchange rate is, by definition, zero. Hence the index variable is $EMP_{jtq} = -(\%\Delta IR / \sigma_{\%\Delta IR})_{jtq}$.

[8] Two standard deviations above the mean is chosen arbitrary.

Figure 1
Empirical Distribution of Exchange Market Pressure



Crisisdummy$_{jt}$ = 1 if $EMP_{jtq} > 2\sigma_{index} + \mu_{index}$ for any q=1,2,3,4 in year t
and
Crisisdummy$_{jt}$ = 0 otherwise. (3)

This dummy variable serves to systematically distinguish those periods experiencing significant pressures on its exchange rate system which we will denote as crisis periods. To see how this dummy variable performs in practice Table 3 identifies the years singled out as crisis periods for the countries in our sample. In the case of Mexico, for example, this methodology picks up the well recorded 1982 and 1994-95 currency crises. In addition, it also identifies 1985-1987 and 1998 as crisis or "stressful" periods. An examination of the economic history of Mexico reveals that during the 1985-1987 period, Mexico was in intense negotiations with respect to rescheduling debt and it was unclear how those negotiations would unfold. In 1998, contagion from the Russian ruble collapse was thought to be responsible for the serious "jitters" felt through-out Latin American markets, including Mexico (Dillion, 1998). Thus, we argue that the *EMP* methodology allows us a systematic avenue by which we can identify "stressful" periods with respect to the exchange rate system[9].

We have thus constructed two separate variables to track pressures on the exchange rate. We will refer to our continuous measure of exchange market pressure as *EMP* and we will refer to the dummy crisis variable constructed from *EMP* as *crisisdummy*.

[9] See Haile and Pozo (2006) for usage of EMP as a currency crisis variable.

Table 3
Currency Crisis Years Identified Using the EMP Series

Country	Crisis Years
Antigua and Barbuda	1981-1983, 1989
Argentina	1981-1985, 1987,1989, 1990-1991
Barbados	1991
Belize	1982-1984, 2003
Bolivia	1982-1985
Brazil	1983, 1987-1994, 1999
Colombia	1983-1985, 1997-1999, 2002
Dominica	1982-1983, 1985
Dominican Republic	1982, 1984-1985, 1987-1988, 1990, 1994, 2002-2003
El Salvador	1979, 1986, 1990, 1992
Grenada	none
Guatemala	1986, 1989-1990, 1992, 1998-1999
Haiti	1980-1983, 1985-1988, 1990-2003
Honduras	1989-1990, 1994, 1996
Jamaica	1979, 1983-1985, 1989 -1993, 1995, 2003
Mexico	1982, 1985-1987, 1994 -1995, 1998
Nicaragua	1979-1981, 1993, 1995
Panama	1979-1985, 1992, 1998, 2000
Peru	1987-1990
St. Kitts and Nevis	1987
St. Lucia	none
St. Vincent and Grenadines	1982, 1987
Trinidad and Tobago	1985-1988, 1993 -1994, 1998

2.2 Measuring per emigrant remittances

While per emigrant remittances is conceptually a simple variable obtained by dividing the total inflow of workers remittances with the stock of emigrants of a given nation, emigration data is simply not easily obtainable. Few nations monitor emigration in a formal sense. In contrast nations do closely track immigration. Given the lack of emigration data, we infer the stock of emigrants by using information on immigration.

The U.S. Population Census is carried out every ten years and reports on the stock of the foreign-born population by country of origin. We use this to obtain the stock of emigrants from any given Latin American nation. The U.S. census aims to enumerate all immigrants regardless of their legal status in the United States. While in practice it is unlikely that all undocumented immigrants are tabulated in the U.S. census, it is noteworthy that in practice great effort is taken to systematically include the undocumented in this tabulation. We argue that this number should serve as a reasonable figure denoting the stock of emigrants in the United States from each country in the world during census years. To update the figure for the intervening non-census years we use information from the Office of Immigration Statistics. The *Yearbook of Immigration Statistics* reports on the annual flow of immigrants to the U.S. by country of birth. These are immigrants who have legally entered the U.S. or have adjusted their status in that year. These are added to the census figures to obtain annual estimates of the emigrant stock.

The figures we derive for the stock of immigrants from each country are "crude" for a variety of reasons. As noted earlier, while the census bureau takes great pains to tabulate the undocumented, the annual inflow reported in the *Yearbook of Immigration Statistics* is limited to documented immigrants. Second, by limiting our analysis of immigration records to those of the U.S., we are excluding, in our stock of emigrants, emigration to other countries in the world.

In Table 4 we summarize per emigrant remittances (in 2003 dollars) for the 23 countries in our sample. These values should not be taken "literally" as they are an average over a large group of diverse emigrants with various family circumstances and ties to the origin country. For example the $535 annual flow listed in the table for Mexican emigrants is substantially lower than the $1330 annual estimate obtained from surveys of remittance senders commissioned by the Multilateral Investment Fund of the Inter-American Development Bank (MIF-IBD). (See Bendixen and Onge (2005) for additional results and details of these surveys.) Our statistic, however, is derived by dividing recorded remittances by the *total* number of emigrants. This total includes, children, spouses, the unemployed, and emigrants who for one reason or other do not remit. The statistic obtained by MIF-IBD is conditioned on those who remit. Hence our statistic is expected to yield a much lower value given that we do not and cannot distinguish remitting from non-remitting emigrants. In addition we note that we undoubtedly have measurement errors in both the numerator and the denominator given the difficulties faced by national governments in tracking remittance inflows and, as we have already discussed, given the challenges of obtaining accurate emigration/immigration data. If however, these errors in measurement are, in a relative sense, constant over

Table 4
Per emigrant Remittances in 2003 U.S. dollars
(Average Over the Sample Period)

Country	Annual Remittances
Antigua and Barbuda	543
Argentina	619
Barbados	904
Belize	375
Bolivia	503
Brazil	6797
Colombia	1753
Dominica	887
Dominican Republic	1068
El Salvador	1261
Grenada	389
Guatemala	1188
Haiti	749
Honduras	967
Jamaica	634
Mexico	535
Nicaragua	822
Panama	191
Peru	2079
St. Kitts and Nevis	439
St. Lucia	1567
St. Vincent and Grenadines	696
Trinidad and Tobago	96

time, we should still be able to discern some of the relationships that exist among the variables of interest and gain some understanding of the observed increases and decreases in the levels of remittances that take place.

2.3 Empirical results

We pool annual data from the 23 Latin American and Caribbean nations from 1980 through 2003, as available. To take advantage of the panel nature of our data, we begin with a fixed effects approach. The choice of a fixed over a random-effects is hypothesized to be the appropriate choice in modeling because many of the non-measured characteristics of the individual countries — which potentially affect the level of remittances relative to each other — are fixed. For example ease and costs of migrating legally or illegally vary across countries, but, generally speaking, remains constant over time. Geographic proximity to the US may play a role in those costs. Since data are unavailable for some segments of time, our panel is unbalanced.

Using the crisis dummy variable *crisisdummy,* (or the continuous "probability of crisis" variable *EMP*) we propose the following model to study remittances:

$$Log\,(R_{jt}) = \alpha + \alpha_1 \log(Y_{USt}) + \alpha_2 \log(Y_{LATjt}) + \alpha_3 Crisisdumm\ y_{jt} + u_j + \varepsilon_{jt} \qquad (4)$$

The "j" represents individual countries and "t" indexes the year. The variable, R_{jt}, is expressed in the form of real US dollar remittances per emigrant. Y_{USt} and Y_{LATjt} represent real per capita income in the United States and in the Latin American (or Caribbean) country.[10] (Detailed explanations of the construction of each of these variables is specified in the data appendix to the paper.) We include the currency crisis variable $Crisisdummy_{jt}$ (or EMP_{jt}) to specifically test the hypothesis that emigrants take into consideration turmoil in the foreign exchange markets of their home countries when transferring funds. In our specification we also explicitly incorporate the fixed effects for each country j to explicitly observe the change in intercept by country.

The results of the estimation of equation (4) are presented in Table 5. Columns (2) and (3) report on the specification that includes *crisisdummy* while columns (4) and (5) report on the specification that incorporates the continuous probability of crisis variable *EMP*. It is generally hypothesized in the literature and it is reasonable to assume that the immigrant's current income level will positively impact the level of remittances. Assuming that U.S. per capita income has some bearing on the income levels of immigrants we would expect that a rise in its value will be positively related to the flow of remittances to the home country. This appears to be the case given the positive coefficient on Y_{us}. Given the double log specification of the remittance equation, the coefficient on Y_{us} can be interpreted as an elasticity. A 10 percent increase in real US per capita incomes leads to a 43 percent increase in real per capita remittances to the home community. The elasticity of real remittances with respect to home country real per capita income is, by contrast, negative and much smaller. A 10 percent rise in home country per capita income reduces remittances by 6 percent, implying that should there be a downturn in home country per capita GDP, the migrant will increase transfers home and make up for a portion of the shortfall in home income.

[10] The single index t in the US income variable (Y_{USt}) recognizes that percapita income in the US is time variant but invariant across individual countries.

Table 5
Fixed Effects Estimators Predicting the Determinants of per Emigrant Remittances

(1) Explanatory variables	(2) Coefficient value	(3) Standard error	(4) Coefficient value	(5) Standard error
Intercept	-37.14***	4.27	-37.49	4.25
Yus	4.38***	0.61	4.44***	0.61
Ylat	-0.61**	0.32	-0.64**	0.32
Crisis dummy	-0.18**	0.09	--	--
EMP	--	--	-0.009**	0.004
Antigua & Bar	0.27	0.42	0.25	0.42
Argentina	-0.87**	0.42	-0.85**	0.42
Barbados	0.04	0.45	0.07	0.45
Belize	-1.15***	0.22	-1.17***	0.22
Bolivia	-2.88***	0.28	-2.88**	0.28
Brazil	1.39***	0.27	1.35***	0.27
Colombia	0.50**	0.24	0.47**	0.24
Dominica	0.74***	0.27	0.69***	0.27
Dom. Rep.	0.06	0.21	0.05	0.21
Grenada	-0.69	0.54	-0.68	0.54
Guatemala	-0.67***	0.24	-0.72***	0.24
Haiti	0.39	0.30	-0.54*	0.29
Honduras	-1.07***	0.28	-1.08***	0.28
Jamaica	-0.96***	0.21	-1.01***	0.21
Mexico	-0.25	0.30	-0.26	0.30
Nicaragua	-1.50***	0.27	-1.54***	0.27
Panama	-1.91***	0.23	-1.98***	0.23
Peru	0.05	0.25	0.07	0.25
St. Kitts & Nev	-0.20	0.29	-0.21	0.29
St. Lucia	0.80**	0.33	0.80**	0.33
St. Vincent & G	0.11	0.36	0.72	0.36
Trinidad & Tob	-2.89***	0.30	-2.91***	0.30
N	375		375	
F (Prob. Value)	40.14 (0.000)		40.17(0.000)	

Notes: El Salvador is the omitted category. *** signifies different from zero at the 1% level or better, **signifies different from zero at the 5% level or better and * signifies different from zero at the 10% level or better.

We argue, however, that the response of emigrants to home income does not tell the complete story of the emigrant's behavior toward home conditions. A comprehensive understanding requires analysis of emigrants' responses to international macro variables—in particular the variable *EMP* and the dummy crisis variable constructed from *EMP — crisisdummy*. Our empirical estimates suggest that indeed remitters take into consideration the values of international macro variables when sending money back home. The coefficient on the dummy variable, *crisisdummy,* suggests that increases in the probability of currency crises are associated with decreased remittances flow. Remitters are responding to currency crises (or the probability of currency crises) in their home economies by reducing the transfer of remittances. The model suggests that when a country's crisis indicator variable moves from 0 to 1, real remittances are decreased by 19.7 percent.[11] Remitters

[11] Obtained as $100[\exp(\hat{\beta})-1]$ where $\hat{\beta}$ is the estimated coefficient for the indicator variable.

appear to be cognizant of crises or stressful exchange market conditions. While central bankers might be anxious to receive dollar inflows during crisis periods, it appears that remitters are not as anxious to comply with these desires—ultimately, making it more difficult for central banks to stabilize the situation.

The fixed effects coefficients are displayed in the remainder of the column. The starred fixed effects coefficients that are negative signify that the intercepts for these nations lie below the intercept for the excluded category (with El Salvador as the excluded category). In contrast, the intercept for Brazil, Colombia, Dominica, and St. Lucia lie above El Salvador's intercept. The intercepts of the non-starred counties (Dominican Republic, Grenada, Haiti, Mexico, Peru, St. Kitts and Nevis, and St. Vincent and the Grenadines) are not statistically different from El Salvador's intercept.

Column (4) reports on the coefficients values when we use a continuous variable for exchange market conditions, *EMP* in place of *crisisdummy*. In this case our results are similar to the first set. Per capita income increases in the host country and per capita income decreases in the home country increase the flow of remittances. In addition, the coefficient value on *EMP* can be interpreted to suggest that a one standard deviation increase in exchange market pressure (8.88 for our series) translates into a 7.68 percent decline in remittances.[12] Remitters appear to shy away from remitting when the odds of currency crisis rise. Rising crisis odds translate into declines in the expected future value of remittances translated into local currency. The finding that remitters avoid remitting when the probability of crisis increases suggests that remitters are forward-looking and calculating economic agents.

With respect to the altruistic versus self-interest view of remittances flows, these results appear to reconcile the two viewpoints. Emigrants behave altruistically as they end up extending larger gifts when the economic situation is less favorable for their family members back home. This is borne out by the responsiveness of flows to declines in home country per capita income. But emigrants also take into consideration the expected value of their gifts to the receiving family members. Several explanations for this behavior are plausible. First, emigrants may be sensitive to the timing of the gifts (acting perhaps paternalistically) by extending gifts when they translate into more units of local currency. Emigrants time these transfers to take place after devaluation or depreciation. This may earn the gift giver more "credits" for generosity or in turn benefit the remitter with more valuable transfers. That is, the remitter is simply attempting to avoid the erosion of the gift that would take place if the gift were extended just before a large or rapid depreciation were to take place. A second reason for delaying transfers in the face of upcoming devaluation may involve the desire on the part of the remitters of taking advantage of a favorable exchange rate for the acquisition of real assets in the home community. The remitter will be in a position to acquire real assets at a better value, if he/she delays the exchange to take place after depreciation (and before inflation sets in). In either case, whether behaving altruistically (paternalistically) or to maximize the value of real asset acquisition, the emigrant experiences greater utility by remitting when dollars can be translated into more pesos.

[12] This is obtained by computing the following: The $\%\Delta$ in remittances = $100[\exp(\hat{\beta}\,\Delta\,X)-1]$ where $\hat{\beta}$ is the coefficient estimate for EMP and Δ X is one standard deviation for the time series of EMP.

Using the fixed effects framework we consider a series of additional specifications to test the robustness of our results. Our first alternative specification is to add a time trend followed by lagging home and host country incomes. The time trend is added to account for the possibility that innovations in communications and money transfer systems have contributed to the ease of remitting money and may therefore be impacting the observed flows. We enter income variables with lags to allow for the possibility that remitters take some time before adjusting to variations in home and host income levels. Table 6 reports on these variants. Turning first to the time trend, we find that coefficient on time is positive and statistically significant, suggesting that, in fact, innovations in the market for remittances have facilitated growth in these flows. Note, also that *time* has sapped significance from the coefficient on US per capita income. Y_{us} and *time* are highly co-linear, making it impossible to separate their individual impacts on remittances. The correlation of the two is 0.98. In contrast *time* and home country per capita income (Y_{LAT}) are much less correlated, with a correlation coefficient of 0.52. Columns (4) and (5) report on estimations which substitute income per capita lagged by one year to allow remittances to respond to past income gains and losses. Overall, the results do not change. Home country income, time and crisis all contribute toward the determination of per emigrant remittances. Host country income does not appear to matter, though its collinearity with *time* likely masks any impact.

Table 6
Alternative Specifications Using Fixed Effects Estimation
Dependent Variable: Log (Per Emigrant Real Remittances)

(1) Explanatory variables	(2)	(3)	(4)	(5)
Intercept	-244.89***	-237.19***	-193.39***	-183.33
	(57.03)	(58.29)	(56.76)	(57.00)
Time	0.14**	0.13***	0.10***	0.09**
	(0.04)	(0.04)	(0.04)	(0.04)
Yus	-1.83	-1.53	--	--
	(1.83)	(1.83)	--	--
Ylat	-0.89***	-0.90***	--	--
	(0.32)	(0.004)	--	--
Yus lag	--	--	0.46	0.88
	--	--	(0.26)	(1.77)
Ylat lag	--	--	-1.11***	-1.13***
	--	--	(0.31)	(0.31)
Crisis dummy	-0.18**	--	-0.15*	--
	(0.09)	--	(0.09)	--
EMP	--	-0.007*	--	-0.01*
	--	(0.004)	--	(0.00)
Country dummies	Included but not reported here			
N	375	375	374	374
F(Prob. Value)	40.42 (0.000)	40.27(0.000)	40.86(0.000)	40.84(0.000)

Notes: Standard errors are in parentheses. Country dummies are not reported in the table. El Salvador is the omitted category. *** signifies different from zero at the 1% level or better, **signifies different from zero at the 5% level or better and * signifies different from zero at the 10% level or better.

We suggested earlier that geography may in one way or another be involved in the level of remittances. Longer distances could either increase or decrease per emigrant remittances. They may decrease per emigrant remittances because "distance may make the heart less fonder,' limiting the obligations and responsibilities that emigrants feel toward their stay-at-home kin. Or if migrants remit to build up stocks of real assets in the home community, distance may complicate the management of said assets, thereby decreasing their optimal level. Distance could alternatively increase the level of per emigrant remittances because the larger costs of migrating might skew emigration to only take place among those who expect larger returns to the migration in the form of the ability to remit larger flows. The fixed effects estimation methodology that we have adopted does not allow us to test the hypothesis that distance matters because distance is a time invariant variable. Hence, in order to gain insights into the impact of geography on remittances we resort to simply pooling the data for the 23 countries in our sample and adding a distance variable to the list of regressors.

In addition to adding a distance variable we allow distance to affect per immigrant remittances in a non-linear way. That is we also include distance squared as an additional regressor. We obtained distance from *Centre D'Etudes Prospectives Et D'Informations Interntionales* (CEPII). The inclusion of a distance variable follows the trade gravity model literature that assumes that forces of attraction coupled with the deterrence of distance dictate the flow of goods. Along the same vein, we posit that geography may have some bearing on the flow of resources from migrants in the host communities to their home communities.

We also consider one additional econometric problem. While we have been testing the hypothesis that crisis impacts remittances, reverse causality is also possible. The flow of remittances could affect the probability of crisis. For example, a reduction in remittances could put pressure on the exchange rate system due to greater scarcity of foreign exchange. Hence, the flow (or lack of flow) of remittances may affect crisis. If this endogeneity exists and is not accounted for, the estimated coefficients on *crisisdummy* and *EMP* may be biased. To correct for this possibility we re-estimate our remittance equation using instrumental variables. We use export growth as an instrument for crisis reasoning that export growth may contribute to diminishing currency crisis, but in and of itself, will not impact remitter's remitting decisions.

The model we are proposing to estimate using OLS with instrumental variables is thus:

$$Log(R_{jt}) = \alpha + \alpha_1 \log(Y_{USt}) + \alpha_2 \log(Y_{LATjt}) + \alpha_3 Crisisdumm\, y_{jt} + \alpha_4 time + \alpha_5 d + \alpha_6 d^2 + \varepsilon_{jt} \quad (5)$$

with *d* representing distance from the home country to the host country. The results of this estimation are presented in columns (2) – (5) of Table 7. We provide a number of estimates. We estimate the equation first without and then with time and in addition use two versions for crisis. Turning first to the estimates without time (columns 2 and 3) we observe that in both cases the coefficient on Y_{US} is positive and statistically significant. However, when we incorporate *time* into the equation (columns 4 and 5) once again we observe that Y_{US} losses its significance. Collinearity in Y_{US} and *time* apparently prevent us from clearly observing how these variables individually affect remittances.

Given that the IV estimation corrects for endogeneity, we re-examine the hypothesis that remitters consider home country exchange rate conditions when remitting. The results in Table 7

indicate that they do. Exchange market pressures continue to deter flows to the home community using either measure. These are displayed in columns 2 and 4 for the specifications incorporating *crisisdummy* and in columns 3 and 5 in the case of the continuous crisis variable *EMP*. The coefficient on *EMP* and on *Crisisdummy* are consistently negative and statistically significant. Remitters shy away from remitting when there is turnmoil in the currency markets.

The coefficients on distance and distance squared are found to be significantly different from zero regardless of specification. Distance reduces remittances, but at a decreasing rate. Using the estimated coefficient values on distance and distance squared in column (2), we note that distances further away from the US decrease per emigrant remittances, up to distances of 4808 kilometers (coefficient on distance/(2 x coefficient on distance squared)). The Dominican Republic's distance from the US is 2509 while Argentina is 8542 kilometers from the US Hence if we begin in the Dominican Republic and move 100 kilometers south, remittances per emigrant will fall. However, starting from Argentina, an additional 100 kilometers will increase remittances per emigrant.

3. Discussion and Conclusions

The primary finding in this paper is that emigrants' remittances do not respond favorably to chaotic or uncertain conditions prevailing in the foreign currency markets back home. This finding is robust with respect to the various functional and data specifications considered here. We found

Table 7
Instrumental Variables Estimates of Determinants of Per Emigrant Remittances
(Standard Errors in Parentheses)

	Dependent Variable: Log (Per Emigrant Real Remittances)			
(1)	**(2)**	**(3)**	**(4)**	**(5)**
Intercept	- 7.78	-15.47	-100.55	57.30
	(13.22)	(9.92)	(136.30)	(146.17)
Yus	1.80*	2.35***	-1.34	4.78
	(1.09)	(0.89)	(4.75)	(4.58)
Ylat	-0.33	-0.38	-0.35	-0.36
	(0.25)	(0.27)	(0.26)	(0.24)
Crisisdummy	-3.02*	--	-3.19*	--
	(1.68)	--	(1.75)	--
EMP	--	-0.14**	--	-0.14**
	--	(0.08)	--	(0.07)
Time	--	--	0.06	-0.05
	--	--	(0.09)	(0.10)
Distance	-0.002***	-0.001***	-0.0023***	-0.0014***
	(0.0007)	(0.0004)	(0.0007)	(0.0004)
Distance squared	2.08e-07***	1.35e-07***	2.13e-07***	1.35e-07***
	(6.40e-08)	(3.89e-08)	(6.63e-08)	(3.81e-08)
N	364	364	364	364
F (prob value)	5.98(0.0000)	6.11(0.0000)	4.77 (0.0001)	5.39(0.0000)

Notes: *** signifies different from zero at the 1% level or better, **signifies different from zero at the 5% level or better and * signifies different from zero at the 10% level or better. Instrument for Crisisdummy and EMP is export growth.

reductions in per-emigrant remittances running from 18 to 25 percent when countries move from a non-crisis to a crisis situation. Using our alternative exchange market variable, *EMP*, also reveals that there are penalties for exchange markets with questionable stability. The notion that emigrants will help prop up weak international currency markets with inflows of dollars is not consistent with our estimates. National governments cannot expect that emigrants will remit funds irrespective of conditions in the currency markets. These results corroborate the conclusions of others including Higgins et al (2004) and Vargas-Silva (2006) who find that increases in exchange rate volatility reduces remittance flows.

The finding that remittances decline with currency crises (and anticipated depreciation) is consistent with various motives for remitting—whether immigrants remit for investment purposes or for altruistic reasons. In either case it makes sense for the remitter to shift the resource inflow to the post-crisis time period. If the remitter is transferring resource to engage in investment, post-crisis conversion will be greater. If the remitter is transferring resources for family consumption, it "pays to wait" for the more favorable rate. Similarly, if remitters desire to remit a set sum in local currency, it can be accomplished with fewer dollars if depreciation has already taken place. To the extent that *EMP* and *Crisisdummy* reflect depreciation that has already taken place, this behavior may also contribute toward the negative coefficient on *EMP* and *Crisisdummy*.

Also of interest is the finding that geography plays a role in the flow of remittances. Distance seems to reduce the flow of remittances to home communities up to a certain distance. Perhaps family attachments are more easily dissolved and/or perhaps the management of investments are more difficult with distance. In any case, the consistently positive coefficient on distance-squared indicates that the relationship between distance and remittances is U-shaped. The distance penalty is counteracted by a positive distance effect which eventually overrides the negative distance effect. This is consistent with the notion that while distance weakens ties with the home community and the desire to remit, another force (e.g. paying back migration costs) increases the amounts remitted with distance.

In sum, our results are consistent with the view that remitters are motivated by both altruism and investment goals, with a primary finding that remitters are cognizant of exchange market conditions in their home communities. This finding has important implications for policymakers. Ratha (2004) makes the claim that remittances provide "a relatively stable source of foreign exchange," (p. 160). While it is conceivable that remittances are more dependable than private short-run capital flows, we caution interested parties in terms of feeling compliant about the reliability of these flows irrespective of macroeconomic conditions. Our results clearly indicate that macroeconomic conditions matter. Central bankers cannot expect remittances to flow irrespective of exchange market conditions.

A few caveats and alternative interpretations need be mentioned regarding our findings. First, it is possible that our variable of interest, workers' remittances from family abroad, is "contaminated" with more traditional short-term speculative flows. This possibility underscores the need to devise consistent data series so that we can better understand and manage economic flows. Second, we made a number of heroic assumptions to devise our emigrant series used to construct the dependent variable in our investigation, remittances per emigrant. Third, it is conceivable that remitters maintain the same overall flow of funds to the home country during crisis periods, but that they channel them differently, perhaps using informal transfer mechanisms to remit. Informal transfers are more difficult to observe and hence may not be recorded leading to

the erroneous conclusion that crises reduce remittance flows. Why might migrant remit differently during crisis periods? If currency controls and repatriation rules are more consistently enforced during crisis periods, remitters may resort to informal remitting channels to evade these controls. Hence it is conceivable that our finding is simply an artifact of the data. Crises do not reduce flows, but they shift the channels by which they are transferred from the host to home communities. We do not think that this is indeed what is taking place. Using individual Mexican level data that details the remitting method used by Mexican immigrants located in the U.S., Amuedo-Dorantes and Pozo (2005) found that over the 1993-2000 period, Mexican migrants have consistently moved away from remitting via informal methods. While 15 percent of transfers were undertaken using informal methods in 1993, by 2000 only 12 percent were channeled in this manner. Currency crisis periods during these periods did not seem to interrupt the decline in usage of informal markets to transmit moneys home.

Overall, we observe that remitters send fewer resources home during currency crisis periods. This behavior is consistent with the notion that emigrants display both altruistic and self-interested motives. Our analysis reveals that remitters appear cognizant of variations in the translation of dollars into local currency and time transfers so as to maximize the translation of dollars into local currency. Though there is some evidence that remitters attempt to smooth the consumption pattern of family members left behind, overall, the strategic behavior displayed by remitters with respect to the timing of the flows may impart a destabilizing macroeconomic impact on receiving economies. It is important that governments are aware of this pattern in remittances so that appropriate macroeconomic policies can be implemented to counter their potentially destabilizing impacts.

Data Appendix

$\mathbf{R_t}$ = (Workers Remittances / Stock of emigrants) /P_{US}.

Workers Remittances: obtained from the World Development Indicators CD issued by World Bank. These series are expressed in US dollars.

Stock of emigrants: To calculate the stock of emigrants we used figures for the stock of immigrants in the US for each Latin American and Caribbean country. The following procedure was used: The US Immigration and Naturalization Service *Statistical Yearbook* reports on the annual flow of immigrants to the US by country of birth. These are immigrants who have legally entered the US or have adjusted their status in that year. The US Census Population, every ten years, reports the stock of foreign-born population by region and country. For those countries in our sample that have a time span starting before the year 1990, we refer to the 1980 census data. We add the immigrant flow for each year to the 1980 stock of foreign-born population. For example: the stock of immigrants in the US from Mexico for the year 1981 is equal to the stock of the Mexican population living in the US in 1980 (obtained from the 1980 decennial census) plus the 1981 flow of Mexican immigrants (obtained from the INS *Statistical Yearbook*.). In order to calculate the stock for 1982, we add the flow of Mexican immigrants in 1982 to the stock for 1981. For those countries in our sample whose series began in 1990 or later, we make the necessary calculations using the initial stock of immigrants reported in the 1990 census. US. Illegal immigrants are not specifically considered in this calculation, insofar as they are not contained in the annual INS reports. However, they are counted (presumably) in the decennial census. Undoubtedly, our numbers are deficient for several reasons: 1) Not all illegal immigrants are necessarily counted. 2) Since we do not have yearly information on return migration, adjustment for these flows only takes place as a result of the new stock of immigrants measure obtained during the decennial census.

$\mathbf{P_{US}}$ is the US consumer price index which is obtained from various issues of the International Finance Statistics CD issued by the International Monetary Fund.

$\mathbf{Y_{US}}$ and $\mathbf{Y_{LAT}}$ are GDP per capita based on purchasing power parity (PPP) in the US, Latin American and Caribbean countries expressed in international dollars. These figures were obtained from the World Development Indicators CD.

Exchange rate depreciation: $\%\Delta e_t = (e_t - e_{t-1})/e_{t-1}$.

$\mathbf{e_t}$ is the nominal exchange rate expressed as the number of national currency units per US dollar. They are obtained from various issues of the International Finance Statistics CD issued by the International Monetary Fund.

IR represents the international reserves for Latin American and Caribbean countries obtained from the International Finance Statistics CD issued by the International Monetary Fund.

Distance: Simple distance variables were obtained from *Centre D'Etudes Prospectives Et D'Informations Interntionales* (CEPII) using distances between the capital cities of the Latin American county and the United States. This can be found at the following web address: www.cepii.fr/anglaisgraph/bdd/distances.htm.

References

Adams, Richard H. "The Economic and Demographic Determinants of International Migration in Rural Egypt." *Journal of Development Studies* 30, no. 1 (1993): 146-67.

Agarwal, Reena, and Andrew W. Horowitz. "Are International Remittances Altruism or Insurance? Evidence from Guyana Using Multiple-Migrant Households." *World Development* 30, no. 11 (2002): 2033-44.

Amuedo-Dorantes, Catalina, and Susan Pozo. "On the Use of Differing Money Transmission Methods by Mexican Immigrants." *International Migration Review* 39, no. 3 (Fall 2005).

Bendixen, Sergio, and Erin St. Onge. "Remittances from the United States and Japan to Latin America: An In-depth Look Using Public Opinion Research." In *Beyond Small Change: Making Migrant Remittances Count*, p. 41-69, edited by Donald F. Terry and Steven R. Wilson. Washington D.C.: Inter-American Development Bank, 2005.

Chami, Ralph, Connel Fullenkamp, and Samir Jahjah. "Are Immigrant Remittance Flows a Source of Capital for Development?" *IMF Staff Papers* 52, no. 1 (2005): 55-81.

De la Brière, Bénédicte, Elisabeth Sadoulet, Alain de Janvry, and Sylvie Lambert. "The Roles of Destination, Gender, and Household Composition in Explaining Remittances. An Analysis for the Dominican Sierra." *Journal of Development Economics* 68 (2002): 309-28.

Dillion, Sam. "Economic Turmoil in Russia Takes Toll in Latin America." *New York Times*, 27 August 1998.

Eichengreen, Barry, Andrew K. Rose, and Charles Wyplosz. "Exchange Market Mayhem: The Antecedents and Aftermath of Speculative Attacks." *Economic Policy* 10 (October 1995): 251-96.

El-Sakka, M.I.T., and Robert McNabb. "The Macroeconomic Determinants of Emigrant Remittances." *World Development* 27, no. 8 (1999): 1493-502.

El-Sakka, M.I.T. "Migrant Workers' Remittances and Macroeconomic Policy in Jordan." Kuwait University Working Paper, 2004.

Faini, Riccardo. "Workers Remittances and The Real Exchange Rate; a Quantitative Framework." *Journal of Population Economics* 7 (1994): 235-45.

Glytsos, Nicholas P. "Remitting Behavior of 'Temporary' and 'Permanent' Migrants: The Case of Greeks in Germany and Australia." *Labour* 11, no. 3 (1997): 409-35.

Haile, Fasika Damte, and Susan Pozo. "Exchange Rate Regimes and Currency Crises: An Evaluation Using Extreme Value Theory." *Review of International Economics*, 2006.

Haque, Nadeem U., Aasim M. Husain, and Peter J. Montiel. "An Empirical 'Dependent Economy' Model for Pakistan." *World Development* 22, no. 10 (1994): 1585-97.

Higgins, Matthew, Alketa Hysenbegasi, and Susan Pozo. "Exchange-Rate Uncertainty and Workers' Remittances." *Applied Financial Economics* 14, no. 6 (2004): 403-11.

Hunte, C. Kendrick. "Workers' Remittances, Remittance Decay and Financial Deepening in Developing Countries." *The American Economist* 48, no. 2 (Fall 2004): 82-94.

Ilahi, Nadeem, and Saqib Jafarey. "Guestworker Migration, Remittances and The Extended Family: Evidence from Pakistan." *Journal of Development Economics* 58, (1999): 485-512.

International Monetary Fund (IMF). *Balance of Payment Yearbook*. Washington, D.C., various issues since 1980.

International Monetary Fund (IMF). *International Financial Statistics*. Washington, D.C., various issues since 1980.

Keely, Charles B., and Bao Nga Tran. "Remittances from Labor Migration: Evaluations, Performance and Implications." *International Migration Review* 23, no. 3 (1989): 500-25.

Lianos, Theodore P. "Factors Determining Migrant Remittances: The Case of Greece." *International Migration Review* 31, no. 1 (Spring 1997): 72-87.

Lucas, Robert E.B., and Oded Stark. "Motivations to Remit: Evidence from Botswana." *Journal of Political Economy* 93, no. 5 (1985): 901-18.

Ratha, Dilip. "Workers' Remittances: An Important and Stable Source of External Development Finance." In *Global Development Finance, 2003,* pp. 157-75. Washington D.C.: World Bank, 2004.

Stark, Oded, and Robert E. B. Lucas. "Migration, Remittances and the Family." *Economic Development and Cultural Change* 36, no. 3 (April 1988): 465-81.

Straubhaar, Thomas. "The Determinants of Workers' Remittances: The Case of Turkey." *Weltwirtschaftl Archiv* 122, no. 4 (1986): 728-40.

Vargas-Silva, Carlos. "The Effect of Foreign Exchange Risk and Return on Workers' Remittances." Western Michigan University, 2006.

Vargas-Silva, Carlos, and Peng Huang. "Macroeconomic Determinants of Workers' Remittances: Host versus Home Country's Economic Conditions." *Journal of International Trade and Economic Development* 15, no. 1 (March 2006): 81-99.

Wahba, Sadek. "What Determines Workers' Remittances?" *Finance & Development* 28, no. 4 (December 1991): 41-44.