

AN EXAMINATION OF REMITTANCE ACTIVITY AMONG BRAZILIAN IMMIGRANTS IN THE U.S. AND CANADA

Franklin Goza¹
Leticia Marteleto²

1 INTRODUCTION

Today the amount of remittances that emigrants send to their nation of origin frequently surpasses all other sources of foreign exchange, including revenues from exports and foreign aid. If recent trends in remittance growth (Russell, Teitelbaum, 1992) have continued over the past decade then emigrants today are remitting nearly \$100 billion per year.

Because of the sheer magnitude of these foreign exchange transfers, they are frequently studied at the macro-level. Such studies tend to focus on government policies designed to monitor and direct these flows (Chanvadavarkar, 1980; Abella, 1992), the volume of these flows (Russell, 1992, 1986; Lianos, 1997; Swamy, 1981; Elbadawi, Rezende Rocha, 1992; Stahl, Arnold, 1986; Massey, Parrado, 1994), or their costs and benefits to origin area development (Arnold, 1992; Athukorala, 1993; Wood, McCoy, 1985; Appleyard, 1989). Numerous other studies focus on the stratification effects of remittances in sending regions (Lundahl, 1985; Fawcett, Arnold, 1987; Reichart, 1982), while still others attempt to determine whether remittances are spent primarily on consumption or productive activities (Keely, Tran, 1989). Thus at the macro-level a wealth of knowledge, too large to summarize here, has already been amassed regarding the transfer of resources.

At the individual or micro-level relatively little is known about remittance patterns (Funkhouser, 1995). A few micro-level

1 Bowling Green State University.

2 University of Michigan.

studies have recently been published that focus on the senders themselves (Menjívar *et al.*, 1998; Durand *et al.*, 1996). In general, these case studies attempt to determine why some emigrants remit and others do not. Still, the number of such studies is small and the results are somewhat mixed. Because of the inconsistency of these baseline studies, their lack of explanatory power, and because they focus on several very specific origin nations, a number of unresolved questions remain.

The goal of our paper is to contribute to this understudied area by focusing on the determinants of remittance behavior at the individual level. More specifically, we will do so by examining those factors that determine who remits, how much they remit, and for what purposes. To explore these questions, we examine unique data sets that permit the analysis of remittance data for individuals sending funds to a nation where this phenomenon has not yet been studied, Brazil. Furthermore, because the data analyzed were collected in Canada and the U.S. using the same survey instrument, just one year apart, our results permit contrasts and comparisons based on country of destination—something that to the authors' knowledge has not yet been done. Such a comparison should either reveal the robustness of certain predictors or suggest the need for methodological and/or theoretical revisions.

This paper will proceed as follows; the next section discusses the growth of Brazilian immigration to North America (N.A.) and related increases in the flow of remittances to Brazil. Section 3 presents our conceptual framework and our research hypotheses. Section 4 will detail our data, hypotheses and methods. The fifth section presents study results and the final section contains our concluding remarks.

2 BRAZILIAN IMMIGRATION TO THE UNITED STATES AND CANADA

Government statistics reveal that Brazilians continue to travel to the U.S. and Canada in record numbers. Prior to the mid-1980s this movement was but a fraction of what it is today (see Table 1). The main reason for this tremendous increase, which began approximately 15 years ago, was the worsening Brazilian economy

(Goza, 1994; Margolis, 1994). Although the economic situation in Brazil has recently stabilized, the social networks now in place (i.e., the system of established Brazilians capable of assisting their compatriots) facilitate the movement and integration of additional newcomers to N.A. Furthermore, Brazil is currently the number one recipient of non-immigrant visas to the U.S. In 1996 nearly 636,000 Brazilians were issued these visas enabling them to travel to the U.S. (U.S. Dept. of State, 1997). Table 1 indicates the rapid increase in this flow, for as recently as 1988 they ranked ninth worldwide in the number of these visas received. While most of these visa holders only spend a short time in the U.S., there are some who opt to overstay their visas and work during their U.S. sojourn (Goza, 1994; Margolis, 1998). One important consequence of their U.S. employment is that they send remittances to those left behind in Brazil.

Table 1
 REMITTANCES SENT TO BRAZIL PER YEAR
 AND THE NUMBER OF U.S. AND CANADIAN NON-IMMIGRANT
 VISAS ISSUED TO BRAZILIANS

Year	Remittances in Millions of Dollars ^(a)	Annual Percentage Increase in Remittances	Number of Non-Immigrant Visas Issued for USA ^(b)	Annual Percent. Increase in USA Visas	World Rank for US Visas	Number of Tourists Entering Canada ^(c)	Annual Percent. Increase Canadian Visas
1987	NA	NA	157,126	NA	8	23,495	NA
1988	19	NA	180,975	15.18	9	31,511	34.12
1989	88	363.16	206,983	14.37	7	33,986	7.85
1990	527	498.86	228,210	10.26	4	35,475	4.38
1991	1057	100.57	265,752	16.45	4	36,335	2.42
1992	1719	62.63	262,750	-1.13	4	28,599	-21.29
1993	1123	-34.67	305,557	16.29	2	29,033	1.52
1994	1834	63.31	339,239	11.02	2	35,330	21.69
1995	2891	57.63	528,038	55.65	2	49,359	39.71
1996	-	NA	635,770	20.40	1	64,056	29.78

Sources: a) Balance of Payments Statistics Yearbook, Vol. 48, Part 1: Country Tables, 1997, International Monetary Fund, Washington, D.C.

b) Report of the Visa Office, United States Department of State, Bureau of Consular Affairs, 1989, 1990, 1991, 1992, 1993, 1994, 1996, 1997.

c) Touriscope – International Travel Between Canada, The United States And Other Countries, Statistics Canada, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1996, 1997.

The increase in Brazilian visitors to Canada parallels that of the U.S. Although the absolute numbers are smaller, the number of Brazilian visitors to Canada has tended to increase every year, such that they now account for more visitors from South America than any

other nation (Statistics Canada, 1997). In fact, during the ten year period 1987-1996, the number of Brazilians annually visiting Canada increased from 23,495 to 64,056, a 173% increase! Worth noting is that until 1987 Brazilians did not need visas to visit Canada, a requirement instituted in 1987 due to the large numbers of impoverished Brazilians arriving at the Toronto airport that year. Given the pronounced increases in this movement, even with the added visa requirement, it is likely that this flow will also continue to increase in the foreseeable future. Furthermore, as in the U.S. case, many of those who visit Canada opt to overstay their visas and seek out employment, which eventually results in the sending of remittances to Brazil (Goza, 1994).

The total amount of remittances sent by emigrants is extremely difficult to accurately measure, yet, as witnessed above, extremely important. The main reason for this is that many funds are sent via informal means, including: returning emigrants, checks, and money orders. Other remittances are sent in-kind, rather than as funds, something which further complicates the measurement process. The World Bank and the International Monetary Fund (IMF) attempt to monitor official transfers, but even these are but at best rough measures (Arnold, 1992; Russell, 1992). Furthermore, it is estimated that transfers via informal channels and the black market could add 50% or more to the official figures (Stalker, 1994). Still, the IMF annually publishes a report that indicates the amount remitted to each nation by workers overseas. In 1995, the last year for which data are available, the amount remitted to Brazil via official channels amounted to nearly 3 billion dollars (IMF, 1997). Unfortunately, even these official numbers do not permit one to determine the source country of these funds. This is especially problematic in the case of Brazil as there are many “*dekassaguis*” (i.e., Brazilians of Japanese origin) who work and remit from Japan, not to mention the Brazilian expatriates similarly engaged in Portugal, Italy and various other European nations. Thus although approximately \$3 billion U.S. were officially remitted to Brazil in 1995, it is virtually impossible to determine the origin of these funds. While we do not wish to downplay the importance of the Japanese contribution to the total pool of Brazilian remittances, especially since they were reported to be \$2 billion dollars in 1995 (Japan Economic Newswire, 1996), we do want to emphasize the strong correlation between the increase in Brazilian visitors to N.A. and the number of dollars remitted to Brazil, as

revealed in Table 1. These results underline the importance of understanding the flow of remittances from N.A. to Brazil, which is the goal of this paper. Accordingly, this study attempts to determine the best predictors of who sends remittances and the amount remitted in two analytical models presented below.

The third and final question we wish to model in this study examines the uses of the funds remitted. At a very general level remittances can be said to be directed either towards productive or consumptive ends. In general, prior research concludes that most remittances are channeled towards meeting basic consumption needs; a result we confirm and discuss further below.

A heady debate about the merits of spending remittances on consumptive activities has ranged for some time. Some authors argue that remittances spent on consumption do little in the long-term to improve the economic condition of those receiving such funds. On the other hand, others observe that the so-called “wasteful expenditure on food, education and medical care [consumptive activities] could have a substantial positive effect over a long period” (Appleyard 1989, p. 492). While we tend to agree with the latter statement, almost all researchers agree that productive investments, especially those with significant multiplier effects, generally have very positive consequences for the receiving economy. Without entering into the substance of this debate, the goal of our third model is to determine those variables that best predict whether one remits for productive or consumptive purposes. We will defer our discussion of the functionality of various remittance uses for a future time.

3 THEORETICAL BACKGROUND

As various authors have noted (Lianos, 1997; Lucas, Stark, 1985), there are no theories that do a good job explaining why people remit. Thus in an attempt to better understand why and how much people remit, as well as for what purposes, we will incorporate concepts from several earlier studies attempting to examine these questions. Because our focus is the behavior of individuals, we have opted to focus on individual-level characteristics and the financial capacity to remit, in a fashion similar to that developed by Menjívar *et al.* (1998).

Although macro-level contextual variables are not explicitly analyzed, they are indirectly monitored as we examine the effects of U.S. and Canadian residence among populations that have very similar socio-economic backgrounds. For example, most residents of both countries arrived in 1987 and the majority of both samples are also from the state of Minas Gerais. Furthermore, educational levels, age and group racial composition are also similar for both samples. Because of these and other common traits, observed differences in remittance behavior could be considered at least partially due to the structural effects of country of residence.

Consistent with the research of Menjivar *et al.* (1998) our first subset of individual-level variables contains several demographic measures and the variable monthly income. These measures monitor the financial capacity to remit (i.e., monthly income), as well as several demographic measures hypothesized to affect remittance behavior. We expect that those with higher monthly earnings will have a greater propensity to remit and among those remitting, higher earnings will be positively associated with the amount remitted per month. Although such hypotheses may seem commonsensical, some past research has shown that those with higher incomes have a lower propensity to remit (Russell, 1986, p. 692).

Among the demographic variables contained in this subset are the measures age and age squared. Because we believe the effect of age on remittance behavior to be nonlinear, and related to one's life cycle stage we have included the variable age squared. The changing needs and requirements of migrants over the course of the life-cycle are well documented (Warnes, 1992), however, they make it difficult to put forth clear hypotheses, as in many cases age will also be affected by other variables. For instance, younger folks who are single might be inclined to remit as much as possible for consumption purposes if they are married with a wife and small children still in Brazil. On the other hand, a young single immigrant desiring to remain permanently in N.A. might never remit. Thus our only prediction regarding age and age squared is that among those remitting, those of younger ages will be more likely to remit for consumption purposes, while as immigrants progress through the life-cycle they will be more likely to remit for productive goals.

Education is the next demographic variable included in this subset. Lianos (1997) reviews several studies indicating very

mixed results for this variable. We anticipate that education will be an insignificant predictor of remittance behavior. The reason for this is the lack of skill transferability. Because of this it is not uncommon to see former professionals driving taxis or cleaning homes. On the other hand, a skilled craftsman or operator with little formal education might be relatively well paid in N.A.

The demographic variables race and gender have not often been used in studies of remittance behavior, however we include them to see whether whites are more likely to remit than whites, and men more likely to transfer funds than women. We expect that both men and non-whites will be more likely to remit than the comparison groups. Because of the latent racism that exists in the U.S. and Canada, we expect that non-whites will earn less and have less financial capacity to remit. Similarly, we expect men to earn more than women and to be more integrated into the cultural tradition that expects them to financially care for other family members whenever possible.

The final measure included in our first variable subset monitors Brazilian state of birth. Other authors (Massey, Basem, 1992; Durand *et al.*, 1996) have demonstrated that one's place of residence can be a significant predictor of remittance behavior. We will contrast those born in the state of Minas Gerais with everyone else in order to monitor the effect of having formerly resided in the state that currently sends the most immigrants to N.A. We hypothesize that *Mineiros* will be more likely to remit, in part due to their desire to maintain transnational links with their origin area communities, and to send more money, when remitting, than their non-*Mineiro* counterparts.

The second variable subset to be included in our multivariate models monitors the effect of various investments immigrants can make in their host country. Succinctly, this subset monitors the effect of increasing familiarity and stability in N.A. on one's remittance behavior. The first two variables in this subset are the variables months in N.A. and months in N.A. squared. We include the quadratic term here because we expect that the effect of North American residence on remittance activity will be nonlinear. In addition, the inclusion of these two variables allows us to test the "remittance decay hypothesis" (Keely, Tran, 1989; Arnold, 1992). In essence this hypothesis posits that over time, as immigrants become more acclimated

to life in the host society, and less likely to return home, they also become less likely to remit. Thus we expect to observe a positive relationship between months in N.A. and a negative one for the squared term. Taken a step further, we expect that the quadratic term will also be positively related to sending remittances for productive purposes, while a negative relationship is expected for the variable months in N.A. This is because new arrivals will likely be busy paying off debts and other consumption requirements, while those in N.A. for an extended period who are still remitting are likely to do so in an attempt to plan for their future financial well-being in Brazil. In essence, however, we view tenure in N.A. as an investment in the host society, an investment in learning many of the social rules of a new society that frequently pays off in economic dividends and has significant effects on remittance behavior.

The variable filed a federal income tax return is used to see if those who have taken the time to invest in learning a North American tax system well enough to file a tax return are less likely to remit. We expect to observe a negative relationship between this variable and remittance sending, since those who file returns are probably positioning themselves to remain in N.A. for an extended time. On the other hand, those staying for only a relatively short time usually never bother to learn how to file a tax return.

The next variable in this subset, stayers (i.e., those desiring to permanently remain in N.A.), is viewed as a type of psychic investment in one's host society. We believe that people desiring to remain forever in their new country will be less likely to remit, and will remit smaller amounts, generally for consumptive purposes, as they themselves do not intend to permanently return to Brazil. As a consequence, all of their major investments are expected to occur in their new host society and not in Brazil. On the other hand, such individuals might occasionally send small, non-productive, gifts to friends or relatives left behind.

The measure studied in N.A. is included in this investment subset as it clearly monitors another investment behavior. In this instance immigrants are attempting to somehow improve upon their human capital skills, probably in an effort to attain a more desirable position or a more enjoyable lifestyle in N.A. As such, we expect that those who have studied in N.A. will be less likely to remit, and when

they do, will remit less. Furthermore, the intended purposes of any remittances they send are expected to be consumptive in nature.

The final variable included in this subset is legal status. Here we expect that those who have taken the time to either normalize their status or to obtain legal immigration documents prior to moving will have invested a great deal of time, energy and often money in order to attain this status. As such, we expect to observe a negative relationship between legal status and the likelihood of remitting, a negative relationship with the amount of funds remitted, and, when funds are remitted, to see them generally used for consumptive rather than productive purposes.

Like Lianos (1997) and others (Menjívar *et al.*, 1998), we believe that while the sending of remittances is a rational action on the part of the remitter, this action is also compelled because of commitment and allegiance to one's family. Thus the final subset of variables to be examined here will monitor one's family obligations. Here we examine the effects of where immigrants' family members are on their remittance activity. In keeping with most demographic research, we expect that those who leave behind other members of their family, especially nuclear family members, will be those most likely to remit, and to remit larger amounts. We also hypothesize that when they remit, they will primarily remit for consumptive purposes. We expect this to occur because we posit that those who leave behind either a spouse and/or minor children are emigrating in order to meet basic needs, rather than to develop a productive investment strategy. Thus in this family subset we look at where one's spouse resides and also examine the effect of having minor children (i.e., those less than 21 years of age) either present in N.A. or left behind in Brazil. The final variable in this subset is number of relatives present in N.A. We hypothesize that the larger this number is, the less likely one will be to remit, and that remittances will be smaller and usually sent for non-productive purposes. This is because we view this measure as a form of host society adjustment, an indication that one is becoming established in their new society, making it less likely they will send money to a place they will never return to on a permanent basis.

The names and definitions of all the independent and dependent variables used in this study are presented in Table 2. Table 3 presents the means and standard deviations for all of these variables, controlling for country of residence.

Table 2
DESCRIPTION OF VARIABLES USED
IN ANALYSES OF REMITTANCES TO BRAZIL
FROM NORTH AMERICA

Independent Variables	Variable Definition
Age	Age in complete years.
Age Squared	Age in complete years squared.
Monthly Earnings	Earnings in dollars.
Log of Monthly Earnings	Natural logarithm of monthly earnings.
Race	1 = white; 0 = nonwhite.
Education	Number of years of school completed.
Gender	1 = male; 0 = female.
Minas Gerais Native	1 = born in Minas Gerais; 0 = born elsewhere in Brazil.
Months in North America	Number of complete months in North America.
Months in North America Squared	Number of complete months in North America squared.
Income Tax Return Files	1 = Federal income tax return filed; 0 = otherwise.
Desires to Permanently Remain in North America	1 = Desired to stay; 0 = otherwise.
Studied in North America	1 = If attended school in North America; 0 = otherwise.
Legal Status	1 = legal; 0 = otherwise.
Spouse in Brazil	1 = if spouse in Brazil; 0 = otherwise.
Spouse Present in North America	1 = if spouse in North America; 0 = otherwise.
Number of Minor Children in Brazil	Number of children less than 21 years of age in Brazil.
Number of Minor Children in North America	Number of children less than 21 years of age in North America.
Number of Relatives in North America	Number of relatives who reside in the same North American nation as the respondent.
Dependent Variables	
Remit	1 = if remits; 0 = otherwise.
Remits for Investment Purposes	1 = if remits for productive purposes; 0 = otherwise.

Table 3
DESCRIPTIVE STATISTICS FOR VARIABLES USED
IN ANALYSES OF REMITTANCES TO BRAZIL
FROM NORTH AMERICA

Variable	Canada		United States	
	Mean	SD	Mean	SD
% Remitting	63.4	.483	57.9	.495
% Remitting for Prod. Purposes	32.3	.470	28.3	.453
\$ Remitted Monthly	571.91	586.10	400.48	341.22
Age	30.325	7.437	32.216	8.679
Age Squared	974.613	554.713	1112.835	647.911
Monthly Earnings	2257.80	1421.07	1570.89	1002.86
Log of Monthly Earnings	7.616	.654	7.215	.543
Race	.747	.436	.677	.469
Education	10.655	2.828	10.441	3.454
Gender	.711	.454	.738	.441
Minas Gerais Native	.649	.478	.641	.481
Months in North America	48.526	39.168	42.426	53.881
Months in North America Squared	3880.979	8990.245	4688.169	18277.869
Income Tax Filed	.632	.673	.241	.429
Desires to Permanently Stay in North America	.443	.498	.277	.449
Studied in North America	.701	.459	.467	.500
Legal Status	.356	.480	.169	.376
Spouse in Brazil	.057	.057	.144	.352
Spouse in North America	.330	.330	.349	.478
Number of Minor Children in Brazil	.464	.977	.600	1.128
Number of Minor Children in North America	.345	.748	.405	.790
Number of Relatives in North America	2.381	4.390	4.087	5.409

Note: N= 195 for Canada, and N= 195, for U.S.

4 METHODOLOGY

a) *Data*

In order to examine the determinants of Brazilian remittances and to compare and contrast the Canadian experience in with that of the U.S., we examine primary data recently collected in Toronto's relatively large Brazilian enclave, and Cidade Congelada (a pseudonym for a city located in the northeastern U.S.). The data analyzed herein were collected in Cidade Congelada between August and December 1990 and in Toronto between August and December 1991. Each sample consists of 195 Brazilian born residents. Because of the nonprobabilistic nature of the sampling framework utilized in this study, something that always occurs when working with a population where many lack proper immigration credentials, as is the case for our sample, it would be inappropriate to attempt to generalize to others outside of the sampling framework. Still, the data used herein did represent approximately four percent of each city's estimated Brazilian population and we believe that these results are highly suggestive of general trends and patterns among these immigrants.³

Although these data are extensively discussed elsewhere (Goza, 1994), a review of some important summary information is warranted. Namely, both samples contain more men than women and more men were married than women (50% vs. 35%). Still, of those married, many migrated with their spouse, although frequently the wife stayed behind, especially when the couple had children. There were, however, many instances of couples immigrating together and leaving the children behind to be cared for by others. In addition, there were many families that migrated as complete units and still others

3 The instruments used in these studies were designed to gather information on immigrants at various life cycle stages. Thus in addition to basic socio-demographic variables, information was also gathered about employment and educational activities prior to departure, as well as the socioeconomic status of the migrants' parents. The questionnaires also contained a detailed employment history matrix for North American work activities, questions about social and linguistic adaptation, migration networks, the international travel experience, remittances, and future plans. Space limitations preclude the discussion of but a few of these measures in this presentation. The average time required to complete each questionnaire was 40 minutes. For a more detailed discussion of this data set, see Goza (1994).

where only some of the children accompanied their parents. Thus the range of family migration strategies includes virtually all possibilities.

Although our two samples are extremely similar on most variables, as we now demonstrate, Canadian immigrants were slightly more likely to send remittances back to Brazil than were their U.S. counterparts (i.e., 63% vs. 58%). However, men in both countries were somewhat more likely to send money back than women (i.e., 58% vs. 57% in the U.S. and 64% vs. 61% in Canada). Also, the average age of those who remit was 32 in Canada, and 30 in the U.S. is 30. Most of those remitting tended to do so on a monthly basis (67% Canada and 63% in the U.S.), while others remitted as frequently as every week or as infrequently as once a year. The average amount remitted per month was \$400 in the U.S. and \$572 in Canada⁴. Approximately 65% of these remittances were used to meet basic consumption requirements. Thus our results correspond with the many previous studies indicating that most remittances on spent on consumptive rather than productive purposes.

b) *Models*

In this study we will explore three research questions: 1) what determines who remits? 2) what determines how much is remitted? and, 3) once remittances are sent, what determines if they are used for productive or consumptive purpose? Thus three distinct dependent variables will be used, one per equation. For every dependent variable we will first estimate one equation for each of the variable subsets discussed above. Next, all three subsets are merged into the combined final model. For each dependent variable these analysis are separately performed for both the U.S. and Canada.

When we explore the first order decision, whether or not to remit, we include all survey respondents and use logistic regression to estimate our model. In model two, where we predict the second order decision, how much to remit per month, we estimate an equation using ordinary least squares (OLS) regression to explain the natural logarithm of the amount remitted. The natural logarithm is used rather than the actual dollar amount as it compresses the range and

4 When the Canadian dollars were converted to U.S. currency the amounts remitted were virtually identical.

skewness of this variable. In this model only those who remit were selected.

In the third model we use logistic regression on only the subsample that remitted in our attempt to predict when remittances are used for productive or consumptive purposes. Respondents indicated that remittances were used in 21 distinct ways. Thus numerous recodes were required in order to generate only the two remittance usage categories of consumption and production. Furthermore, given the long-standing debate over where most remittances are ultimately directed (see Russell, 1992 for a review) and whether or not all consumption should be viewed as non-productive (Chanvadavarkar, 1980; Stahl, Arnold, 1986) we had numerous points to consider. Ultimately we decided to consider major housing expenses as productive investments. We opted to do so because unlike most consumptive behavior, this is an investment, something that one is able to use and eventually resell for a profit, if desired. In addition, because of the various multiplier effects that occur throughout the economy, directly and indirectly, as construction inputs are purchased and labor contracted, we believe that housing investments are most appropriately considered productive rather than consumptive expenditures.

5 RESULTS

Our presentation of results for the three models to come will proceed as follows, first, using the U.S. sample, we review our results for the three variable subsets followed by a discussion of the complete model. Next, we will do the same for the Canadian sample. The discussion of each model closes with a comparison of the U.S and Canadian results.

a) *Model 1 – Predicting Who Remits*

Recall that our first variable subset monitors individual characteristics and the financial capacity to remit. This subset resulted in a modestly significant equation ($p < .1$), but the only significant variable was race ($p < .05$). As hypothesized, this result suggests that whites in the U.S. were more likely to remit than non-whites. Much to our surprise, none of the other variables, including income, were significant. The second variable subset, investments in N.A.,

resulted in a very poorly fitting model without a single significant predictor. On the other hand, the third variable subset, family obligations, resulted in a very good fit ($p < .001$). In this subset the variables number of minor children in Brazil and number of relatives in N.A. were both significant and in the predicted directions. Furthermore, when the complete model was run both of these predictors not only maintained their significance levels, but they actually became more significant. The overall fit for the complete U.S. model was good ($p < .001$), however, the only other variable in this model that was significant was race, whose significance declined slightly ($p < .01$).

Model 1 results for the Canadian sample are very distinct from those just witnessed for the U.S. Again the fit for subset one was not very good ($p < .1$) and again, contrary to expectations, income was insignificant. This time, however, the measures monitoring education and *Mineiro* status were both modestly significant ($p < .1$). Those with more education were more likely to remit, while those born in Minas Gerais were less likely to remit. Subset two, investments in N.A., was highly significant for the Canadian sample ($p < .001$). Legal status indicated that those legally in Canada were significantly more likely to remit ($p < .05$) than those without proper documentation. This result ran counter to our expectations. The variables months in N.A. and months in N.A. squared were both significant in the expected directions, results that add support to the remittance decay hypothesis, that the longer people are away, the less likely they are to remit. The family obligations subset resulted in an extremely poor fit for the Canadian sample. Furthermore, it contained not a single variable that was a significant predictor. The complete model for the Canadian sample was only modestly significant ($p < .05$), and contained only one significant predictor, legal status. Thus the significant effects that earlier provided support for the remittance decay hypothesis disappeared, as did the significance of the variables monitoring *Mineiro* status and education.

In comparative terms Model 1 fit the U.S. sample better than it did the Canadian one. In addition, the complete U.S. model and that for the family obligations subset were both highly significant ($p < .001$). Still, there are many questions that remain unanswered by this model. For instance, why is it that income has no effect on remittance behavior? Although this variable has also been insignificant in other similar studies (Durand *et al.*, 1996; Massey, Basem,

1992), common sense says that there should be a significant relationship. Likewise, why is it that the family variables are so robust in the U.S. case but fail to even attain significance in the Canadian sample? Or why are those who are legally in Canada more likely to remit than those there illegally?

b) *Model 2 – Predicting How Much is Remitted*

In Model 2 our attention turns to the amount transferred per month by those who remitted. Because it was impossible to calculate monthly remittance amounts for all respondents, some cases were lost due to these missing values. Thus in this analysis and that of Model 3 we are using N's of 109 for the U.S. sample and 92 for the Canadian one.

The first variable subset for the U.S. sample resulted in a relatively poorly fitting model ($R^2 = .10$). The only significant predictor here was gender ($p < .05$) indicating that among those remitting men send more, a result earlier hypothesized. The second U.S. subset, investments in N.A., fit very poorly ($R^2 = .05$) and yielded not a single significant predictor. The third subset on the other hand, family obligations, resulted in a better fit ($R^2 = .14$) and produced several significant predictors. As expected, the presence of a spouse in Brazil was associated with greater monthly remittances, while the number of minor children present in N.A. was negatively associated with the amount sent. In other words, the presence of one's nuclear family members is very important in determining where one's earnings end up. The complete version of Model 2 for the U.S. sample resulted in a good fit at $R^2 = .24$. In this model the importance of gender and spouse in Brazil remained, while number of minor children in N.A. became an insignificant predictor. However, the variable filed a federal tax return did become a significant predictor in the expected direction. In other words, those filing returns, who we believe are investing in a North American future, sent smaller amounts when remitting.

Among the Canadian sample subset one produced a solid equation ($R^2 = .19$) although only the variable monthly earnings was significant. In other words, this results tells us that the more money someone makes, the higher their monthly remittances are likely to be. Subsets two and three, investments in N.A. and family obligations, yielded the poorest fits of any of our models ($R^2 = .03$ and $R^2 = .06$) and produced not a single significant result. In terms of its R^2 the complete

version of Model 2 for the Canadian sample was a significant improvement over the earlier partial models ($R^2 = .31$), however, the only variable in this entire model to be significant was monthly earnings.

Thus although in relative terms both complete versions of Model 2 produced results that explained a significant amount of the observed variance, this did not occur in the manner hypothesized. Most hypothesized relationships failed to emerge, as in the Canadian sample only monthly earnings was significant, while in the U.S. one only gender (i.e., men were more likely to remit) and those married with a spouse in Brazil emerged significant. No significance was ever attained for any investment in N.A. variable.

c) *Model 3 – Predicting Whether Remittances are used for Production or Consumption*

In Model 3 several predictors attained significance for the first time. In subset one for the U.S. sample both age and age squared were modestly significant ($p < .1$) in the predicted directions. That is, the young who remitted were less likely to invest productively, while older individuals who remitted were more likely to do so for productive motives. In addition, *Mineiro* status was negatively and significantly related to remitting for productive purposes. Although these three variables were modestly significant, the chi-square result for this model was insignificant. The investments in N.A. subset also failed to generate a significant chi-square statistic, however both months in N.A. and months in N.A. squared were significant in predicted directions. That is, those with less time in the U.S. were more likely to remit for consumptive reasons, while those with greater U.S. tenure were more likely to send funds back for productive reasons. Subset three did result in a modestly significant chi-square result ($p < .1$), but only the variable number of minor children present in Brazil was significant ($p < .05$). As hypothesized, the more minor children one had in Brazil, the more likely one's remittances were to be directed towards consumption activities. The complete Model 3 for the U.S. resulted in a significant improvement over the partial U.S. models ($p < .05$). Although the individual characteristics earlier observed to be significant (age, age squared and *Mineiro* status) became insignificant in this model, the measures months in N.A., months in N.A. squared and the number of minor children in Brazil retained their significance. In addition, the variable filed an income tax return also

became significant, but in a positive direction, the opposite of what we had hypothesized. Thus in this complete model the subset investments in the U.S. became extremely important, as three of its six variables were significant at $p < .05$. Recall that up to this point only one of these variables, income tax filing, had ever been a significant predictor.

In the Canadian sample subsets one and two both resulted in insignificant chi-square statistics. In subset two, however, the variable legal status attained significance, and this time in the predicted direction as those legally in Canada were more likely to remit for consumptive rather than productive purposes. Recall that we expected that those who made the effort to become legal would probably only send gifts and other similar items (i.e., all unproductive investments) back to Brazil as they would not likely ever return to live there permanently. We also observed in Model 1 that those legally in Canada more likely to remit than those there illegally. Apparently this is because they are sending money back as gifts *etc.* to family and friends left behind. Subset three, family obligations, for the first time in the Canadian sample, yielded a significant result ($p < .01$). Here as in the U.S., the number of minor children still in Brazil was negatively related to the usage of remittances for productive activities. The consistency of this result seems to underline the importance to those who have left children behind to continue to assist them in meeting their day-to-day consumptive requirements. In the complete version of Model 3 for the Canadian sample the variable number of minor children in Brazil retains its statistical significance. Such robustness reinforces the point made above about a parent's need to continue to care for their children regardless of where they are. In this complete model legal status also retains its significance. Furthermore, the variable filed a tax return also became modestly significant ($p < .1$) although not in the expected direction.

6 CONCLUSIONS

In sum, the results examining who remits, how much they remit and remittance usage (presented in Tables 3, 4 and 5) produced some models that fit our data relatively well. Compared with numerous other similar studies (e.g., Massey, Basem, 1992) our results

represented significant improvements in model fits. Still, these results did not always conform to our hypotheses and occasionally they were even contrary to expectations. Perhaps the main finding of this study is that in general, when comparing and contrasting individual and family attributes across nations, even when the populations are highly similar, you will observe distinct results for each nation. Although there were some similarities, there were many fewer than we had expected to find. It is instead the differences in significant predictors that was most noticeable. In the U.S. sample the family obligation variable subset consistently attained significance. In the Canadian case this only happened once. Why is it that family variables explain so much more in the U.S. than Canada concerning who remits *etc.*? On the other hand, the investment in N.A. subset was usually significant for the Canadian sample but almost never so in the case of the U.S. Why is this occurring when at a theoretical level these variables are equally important to both groups? Finally, why were the individual level, financial capacity to remit variables and demographic measures generally so insignificant for both samples?

Thus even though we produced some modestly powerful models, much theoretical work remains. The first need is to improve upon our conceptual framework such that we can better account for intersocietal differences in remittance behaviors. Obviously this will require the incorporation of additional macro-level factors that were not included in our models. But which ones? Also, as demonstrated by Tables 4, 5, and 6 clearly the same variables should not be used to all three of the dependent measures examined herein. Although we recognized this long ago, we opted to present this study as is in order to show the need to tailor the predictors to the specific needs of each independent variable. We hope that this baseline study has been provided insights to future researchers who wish to study these questions further.

Table 4
COEFFICIENTS FOR VARIOUS LOGISTIC REGRESSION MODELS OF
THE LOG ODDS OF REMITTING FUNDS TO BRAZIL, BY COUNTRY
(standard errors in parentheses)

Independent Variable	United States				Canada			
	1	2	3	4	1	2	3	4
Individual Characteristics & Financial Capacity to Remit								
Age	0.138 (0.114)			0.054 (0.129)	0.185 (0.116)			0.146 (0.131)
Age Squared	-0.002 (0.002)			-0.002 (0.002)	-0.003 (-0.003)			-0.002 (0.002)
Monthly Earnings	0.000 (0.000)			0.000 (0.000)	0.000 (0.000)			0.000 (0.000)
Race	0.369 ⁽²⁾ (0.170)			0.364 (0.196) ⁽¹⁾	0.046 (0.190)			0.015 (0.215)
Education	-0.074 (0.049)			-0.027 (0.061)	0.121 ⁽¹⁾ (0.063)			-0.085 (0.074)
Gender	0.077 (0.178)			0.139 (0.204)	0.110 (0.194)			0.200 (0.211)
Minas Gerais Native	-0.110 (0.162)			-0.169 (0.197)	-0.310 ⁽¹⁾ (0.171)			-0.114 (0.201)
Investments in North America								
Months in North America		0.005 (0.009)		0.012 (0.012)	0.038 ⁽²⁾ (0.015)			0.013 (0.017)
Months in North America Squared		-0.000 (0.000)		-0.000 (0.000)	-0.000 ⁽³⁾ (0.000)			-0.000 (0.000)
Income Tax Return Filed		-0.056 (0.217)		-0.192 (0.251)	-0.272 (0.219)			-0.352 (0.253)
Desires to Permanently Remain in North America		-0.184 (0.171)		-0.269 (0.210)	0.155 (0.165)			0.104 (0.179)
Studied in North America		-0.025 (0.149)		-0.133 (0.177)	0.252 (0.184)			0.192 (0.204)
Legal Status		0.300 (0.252)		0.199 (0.291)	0.561 ⁽²⁾ (0.192)			0.435 ⁽²⁾ (0.208)
Family Obligations								
Spouse in Brazil			-0.253 (0.341)	-0.377 (0.404)			-0.791 (0.556)	-0.620 (0.596)
Spouse in North America			0.267 (0.195)	0.254 (0.219)			-0.042 (0.181)	-0.071 (0.206)
Number of Minor Children in North America			-0.141 (0.225)	-0.149 (0.278)			0.126 (0.247)	0.145 (0.302)
Number of Minor Children in Brazil			0.527 ⁽²⁾ (0.229)	0.933 ⁽³⁾ (0.302)			0.097 (0.170)	0.246 (0.250)
Number of Relatives in North America			-0.055 ⁽¹⁾ (0.031)	-0.086 ⁽²⁾ (0.037)			-0.056 (0.043)	-0.009 (0.057)
Model chi-square	13,028 ⁽¹⁾	4,153	28,587 ⁽⁴⁾	54,571 ⁽⁴⁾	12,745 ⁽¹⁾	27,747 ⁽⁴⁾	6,889	34,156 ⁽²⁾
Degrees of Freedom	7	6	5	18	7	6	5	18

Source: BGSU – Brazilian Immigration to Ontario, 1991 and Brazilian Immigration to the United States, 1990.

(1) p < .10; (2) p < .05; (3) p < .01; (4) p < .001. // N = 195 per country.

Table 5
UNSTANDARDIZED OLS COEFFICIENTS
FROM REGRESSION MODELS PREDICTING THE ANNUAL
AMOUNT REMITTED BY BRAZILIAN IMMIGRANTS TO
NORTH AMERICA, BY COUNTRY
(standard errors in parentheses)

Independent Variable	United States				Canada			
	1	2	3	4	1	2	3	4
Individual Characteristics & Financial Capacity to Remit								
Age	-0,093 (0,076)			-0,107 (0,086)	0,006 (0,073)			0,085 (0,089)
Age Squared	0,001 (0,001)			0,001 (0,001)	-0,001 (0,001)			-0,002 (0,001)
Monthly Earnings	0,000 (0,000)			-0,000 (0,000)	0,000 ⁽³⁾ (0,000)			0,000 ⁽³⁾ (0,000)
Race	-0,097 (0,171)			-0,088 (0,173)	-0,031 (0,202)			-0,105 (0,222)
Education	0,010 (0,025)			0,034 (0,028)	-0,013 (0,034)			-0,030 (0,038)
Gender	0,439 ⁽²⁾ (0,200)			0,361 ⁽¹⁾ (0,207)	-0,189 (0,224)			-0,230 (0,238)
Minas Gerais Native	0,179 (0,182)			0,115 (0,186)	0,054 (0,214)			0,067 (0,222)
Investments in North America								
Months in North America		-0,002 (0,006)		0,005 (0,006)		-0,010 (0,017)		-0,019 (0,018)
Months in North America Squared		0,000 (0,000)		0,000 (0,000)		0,000 (0,000)		0,000 (0,000)
Income Tax Return Filed		-0,381 (0,245)		-0,463 ⁽¹⁾ (0,247)		-0,173 (0,279)		-0,129 (0,287)
Desires to Permanently Remain in North America		-0,150 (0,185)		-0,096 (0,189)		-0,077 (0,206)		-0,117 (0,192)
Studied in North America		-0,101 (0,174)		-0,080 (0,177)		-0,146 (0,212)		-0,132 (0,219)
Legal Status		0,295 (0,304)		0,245 (0,310)		0,258 (0,235)		0,353 (0,230)
Family Obligations								
Spouse in Brazil			0,737 ⁽³⁾ (0,239)	0,609 ⁽²⁾ (0,279)			-0,005 (0,381)	0,048 (0,379)
Spouse in North America			0,085 (0,216)	0,199 (0,230)			-0,222 (0,242)	-0,139 (0,239)
Number of Minor Children in North America			-0,208 ⁽¹⁾ (0,123)	-0,148 (0,136)			-0,256 (0,204)	-0,340 (0,219)
Number of Minor Children in Brazil			-0,044 (0,074)	0,066 (0,092)			-0,062 (0,113)	-0,062 (0,119)
Number of Relatives in North America			-0,009 (0,021)	-0,018 (0,022)			0,000 (0,035)	0,011 (0,041)
[N]	109	109	109	109	92	92	92	92
F Statistic	1,640	0,978	3,448 ⁽³⁾	1,607 ⁽¹⁾	2,850 ⁽²⁾	0,433	1,131	1,796 ⁽²⁾
R Squared	0,102	0,054	0,143	0,243	0,192	0,030	0,062	0,307

Source: BGSU – Brazilian Immigration to Ontario, 1991 and Brazilian Immigration to the United States, 1990.

(1) $p < .10$; (2) $p < .05$; (3) $p < .01$; (4) $p < .001$. // N = 195 per country.

Table 6
COEFFICIENTS FOR VARIOUS LOGISTIC REGRESSION MODELS
OF THE LOG ODDS OF REMITTING FUNDS
FOR INVESTMENT PURPOSES TO BRAZIL, BY COUNTRY
(standard errors in parentheses)

Independent Variable	United States				Canada			
	1	2	3	4	1	2	3	4
Individual Characteristics & Financial Capacity to Remit								
Age	-0.349 ⁽¹⁾ (0.194)			-0.4085 (0.263)	-0.019 (0.278)			0.462 (0.376)
Age Squared	0.005 ⁽¹⁾ (0.003)			0.0062 (0.004)	-0.001 (0.004)			-0.007 (0.006)
Monthly Earnings	0.000 (0.000)			0.0005 (0.000)	0.000 (0.000)			-0.000
Race	-0.292 (0.240)			-0.3956 (0.284)	-0.343 (0.253)			-0.073 (0.295)
Education	0.033 (0.070)			0.3049 (0.305)	0.071 (0.080)			0.028 (0.099)
Gender	0.118 (0.268)			0.0273 (0.305)	0.064 (0.254)			0.012 (0.301)
Minas Gerais Native	-0.515 ⁽¹⁾ (0.284)			-0.5661 (0.345)	0.130 (0.237)			0.036 (0.296)
Investments in North America								
Months in North America		0.036 ⁽²⁾ (0.015)		0.050 ⁽²⁾ (0.021)		-0.013 (0.021)		-0.005 (0.029)
Months in North America Squared		-0.000 ⁽¹⁾ (0.000)		-0.000 ⁽²⁾ (0.000)		0.000 (0.000)		0.000 (0.000)
Income Tax Return Filed		0.529 (0.355)		0.985 ⁽²⁾ (0.450)		0.310 (0.285)		0.700 ⁽¹⁾ (0.407)
Desires to Permanently Remain in North America		0.261 (0.251)		0.234 (0.300)		0.221 (0.210)		0.232 (0.243)
Studied in North America		-0.319 (0.230)		-0.199 (0.266)		0.056 (0.214)		0.343 (0.297)
Legal Status		0.334 (0.420)		0.397 (0.472)		-0.492 ⁽²⁾ (0.245)		-0.610 ⁽²⁾ (0.301)
Family Obligations								
Spouse in Brazil			-0.084 (0.390)	0.175 (0.505)			3.078 (9.190)	3.105 (8.631)
Spouse in North America			0.076 (0.299)	-0.034 (0.350)			0.383 (0.263)	0.354 (0.309)
Number of Minor Children in North America			-0.034 (0.333)	0.067 (0.414)			0.345 (0.385)	0.197 (0.524)
Number of Minor Children in Brazil			-0.724 ⁽²⁾ (0.324)	-0.817 ⁽¹⁾ (0.418)			-0.803 ⁽²⁾ (0.391)	-1.249 ⁽²⁾ (0.492)
Number of Relatives in North America			-0.010 (0.056)	-0.068 (0.086)			0.041 (0.075)	0.020 (0.106)
Model chi-square	11,615	8,592	9,637 ⁽¹⁾	30,295 ⁽²⁾	8,870	8,365	18,23 ⁽³⁾	34,081 ⁽²⁾
Degrees of Freedom	7	6	5	18	7	6	5	18

Source: BGSU – Brazilian Immigration to Ontario, 1991 and Brazilian Immigration to the United States, 1990.

(1) $p < .10$; (2) $p < .05$; (3) $p < .01$; (4) $p < .001$. // N = 195 per country.

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