DETERMINANTS AND VOLATILITY OF REMITTANCES IN THE CARIBBEAN

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Presented at the 29th Annual Review Seminar
Research Department
Central Bank of Barbados
July 28-31, 2008

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ABSTRACT

For most developing countries, remittances are the second largest source of external development financing, behind foreign direct investment (FDI). Remittances are however considered to be less volatile than FDI and provide a stable flow of money to the receiving country. The focus of the paper is to examine the volatility and determinants of remittance flows in the Caribbean. The volatility of remittances as compared to the other capital flows was investigated by employing an average rolling five-year standard deviation of growth rates for remittances, FDI and official capital flows for each country. The impact of the macroeconomic variables chosen was determined by using cross-sectional time series data on 15 Caribbean countries for the period 1987 to 2005. Estimates of the model used were then derived using panel feasible Generalised Least Squares (GLS) with cross-section weights. The results indicated that remittances are generally less volatile than FDI and official capital flows and the determinants suggest the actions that need to be taken to mobilise the flow of remittances in the Caribbean.

JEL Classification:

Key words: Remittances; Determinants; Volatility; FDI; Official capital flows

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1. Introduction

Remittances are financial resource flows arising from the cross-border movement of nationals in a country (Kapur, 2003), and have become the second largest source, behind foreign direct investment (FDI), of external funding for developing countries. More importantly, remittance flows have been identified as the most stable source of external finance, predominantly from developed economies to developing economies. Additionally, the nature and volatility of foreign direct investment and official capital flows has focused the attention on remittances as a new and potential source for development finance and economic growth.

Over the past decade, remittance flows to the Caribbean region have steadily increased, while other sources of external funding have declined. As a result, remittance currently constitutes the second largest source of external finance for the Caribbean, second only to private investment flows. This paper therefore, examines whether remittances provide a stable inflow of money to Caribbean countries, compared to other capital flows by examining the determinants and the volatility of remittance flows in the Caribbean.

The data used is sourced from various Central Banks throughout the region, the World Bank's World Development Indicators Database (2007) as well as the International Monetary Fund's International Financial Statistics Database (2007). Even today the quality of remittance data is not good. In most country cases, the values reported appear to be underestimated and often, data for the earlier years is missing. Difficulty may also arise when comparing data, as some countries may use different techniques to capture remittances. The variable remittances used in the study include worker's remittances plus compensation of employees[1]. The study is different to past papers on remittances in the developing countries in that it focuses not only on the Caribbean but it also identifies policy positions which should follow, given the volatility of remittances as compared to other capital flows and the impact of the macroeconomic determinants on remittances.

[1] Compensation of employees (the wage, salaries and other benefits earned by migrants who have lived abroad for less than one year)

Section 2 reviews the theoretical and empirical literature on remittances. Section 3 examines the profile of money remittances in the Caribbean region, while section 4 analyses the volatility of remittances relative to FDI and official capital flows. Section 5 introduces and analyses the macroeconomic determinants of remittances while Section 6 concludes the paper and offers some policy implications.

2. Review of Literature

Buch and Kuckulenz (2004) use panel data for 87 developing countries to determine the importance of worker remittances to developing countries in quantitative terms, by examining the magnitude of remittances relative to key macroeconomic variables such as gross domestic product, international trade and international capital flows. They also investigate the determinants driving worker remittances, focusing on the main macroeconomic determinants of remittances. Thirdly, they also explore the volatility of worker remittances and whether they are correlated to other types of capital flows. The authors indicate, that similar to official and private capital flows, remittances are motivated both by market-based and social considerations, and they conclude that the traditional variables such as economic growth, the level of economic development and proxies for the rate of return on financial assets did not have a clear impact on the size of remittances a country receive. Of the 87 countries studied, remittances were more than 5 percentage points of GDP for 19 of them, suggesting that remittances played an important role in these economies. For most countries remittances were smaller than official and private capital flows. As theory predicts, the correlation analysis shows a positive correlation between worker remittances and official capital flows and between official capital flows and private capital inflows, but there is no correlation between remittances and private capital inflows. Volatility of remittances for more than 80 percent of the countries was lower than the volatility of private capital flows and also lower than volatility of official capital flows for more than 70 percent of the countries. The findings provide evidence that worker remittances provide a stable source of money to the recipient country, compared to other capital inflows.

Chami et al. (2003) examine the role of remittances in development and economic growth by establishing a framework that links the motivation for remittances with their effects on economic activity. They suggest that the flow of remittances under asymmetric information and economic uncertainty presents a significant moral hazard problem and will have a negative effect on economic growth. Using a panel of aggregated data on remittances, per capita GDP, gross domestic investment, inflation, education enrolment, and net private capital flows for 113 countries over the 1970 to 1998 period, Chami et al. (2003) construct a model that motivates remittances through altruism and follows their effects on the recipients' labour market behaviour. The model is easy to modify and allows for the inclusion of other motivations and their effects. The authors present country by country indicators of the importance of workers remittances, which indicate, that, in several countries, remittances account for more than 15 percent of GDP and are the most important source of foreign exchange. Empirical estimations show considerable evidence that remittances differ greatly from private capital flows in terms of their motivation and effects. The evidence supports the idea that remittances act primarily as compensatory transfers, and have a negative effect on economic growth. The findings also show that remittances do not appear to be a significant source of capital for economic development. They further conclude that the use of remittances as a source of development capital would require altering the very nature of remittances from compensatory transfers to investments.

Wendel (1996) reveals that in the Caribbean, the contribution of remittances to development depends on the uses to which remittances are put. Conspicuous consumption will result in very little economic development given the high import content in the consumption pattern of the individual countries. Investment of remittances in capital imports and raw materials is necessary for economic development, since the capital goods sector is not well developed. Dixon (1997) stresses that remittance flows to labour-exporting countries such as in the Caribbean have been an unexploited source of economic development finance, and given that the rest of the world is competing for financial resources, measures should be put in place to make domestic financial markets more attractive and efficient to induce more of the investment portions of migrants' remittances.

Ratha (2003) identifies remittances as one of the least volatile sources of foreign exchange earnings for developing countries in the 1990s. During the period 1998 to 2001, in the wake of the Asian financial crisis, Ratha examines how capital flows rise during favourable economic cycles and fall in bad times, while remittances react less violently and show stability over time. He posits that remittances intended for consumption should be less volatile than those intended for investment, since migrants may increase remittances in times of hardship, especially where families may depend heavily on remittances as a source of income. Remittances for investment purposes are however less likely to suffer the sharp withdrawals that characterise portfolio flows to emerging markets, as migrants are more likely to continue to invest in their home country despite economic misfortune than are foreign investors. According to Ratha, remittances for investment purposes have been on the rise, especially in low-income countries. He also, illustrates how the size and volatility of remittances increase as low-income countries liberalised their current and capital accounts in the 1990s. Kapur (2003) states that remittances have long-term implications for economic development, especially in low-income countries, where remittances are an important source of social insurance, provide liquidity for small enterprises as well as capital investments in equipment, land and housing purchases.

3. The Profile of Workers Remittances in the Caribbean Region

The Latin American and Caribbean region represent the largest recipient of remittances in nominal terms when compared to the other regions of the world Ratha (2003). Data indicate that the size of the remittance flows to the Caribbean region is increasing and can be a very importance and reliable source of development finance vis-à-vis FDI and official capital flows. The data also show that Haiti, Jamaica and Guyana are the top three recipients of remittances in CARICOM and that, as a proportion of GDP, remittances are more significant to these three countries than any other country in CARICOM. Based on the ratio of net remittances to GDP and to exports (Table 2 and 3), remittances play a very significant role in the level of economic activity in the countries which have experienced high net migration, especially the Dominican Republic, Jamaica, Haiti and the OECS countries (except Antigua and Barbuda).

Dixon (1997), in her study of the importance of the flow of remittances to Jamaica during the period 1962 to 1996, identifies remittances as an importance source of foreign exchange, contributing significantly to real estate, education financing and consumption. During the period, remittance inflows were consistently higher than inflows from tourism, bauxite, sugar and bananas and were an important source of financing for Jamaica's goods and services deficit. Over the period 1990 to 1996, remittances also represent a major percentage of gross domestic product (9.2%) and net disposable income (8.1%). Dixon also contends that heavy reliance should not be placed on remittance flows, as their sustainability may be uncertain due to the lack of knowledge of the specific structural relationships between remittances flowing to Jamaica and its determinants.

Since 2000, Guyana has been the second largest recipient of remittance inflows to the English-speaking Caribbean region, with remittances increasing by US$223 million in 2005 from US$47 million in 2000. Kirton (2006) cites a study done by Orozco in 2002, in identifying the social and economic benefits of remittances to Guyana. Consumption of commodities and services, investment in real estate and commercial motor vehicle (taxis and buses) and investment for retirement planning were the major uses of remittances identified. Orozco (2002) refers to Guyana as a "country of migrations", and suggests that the number of Guyanese living outside Guyana may be as high as the total population living in the country. He maintains that the flow of remittances sent back home are significantly high relative to the country's main economic indicators. Orozco states that the flows are however, underestimated and the costs of sending money are among the highest in the Americas. Orozco (2002), like Wendel (1996), also mentions the size of the remittances relative to the large population of Guyanese living abroad. Using World Bank data, he shows that remittances represent more than FDI and nearly as much as current official development assistance from donor countries.

World bank data indicates that remittance flows to Haiti are more than six times higher, from US$152 million in 1996 to US$985 million in 2005 (Table 1), representing over 5% and 43% of GDP respectively (Table 2). Fagen (2006) explains that remittances surpass over 100% of the nations national exports and is more than international assistance received. As seen in Table 3, since 2000, remittances as a percentage of exports has exceeded 100%. The dependence on

remittances has grown as the country's economy overall has deteriorated. Fagen (2006) reports that although remittances have grown the flow of remittances along with international assistance seems inadequate in addressing poverty in Haiti's. Instead of being used for savings and investment purposes to enhance economic development, most of the remittance flows are channelled to education and health care services, which do not benefit greatly from government inputs.

The data also show that remittance flows to the two most developed countries in the region, that is, Barbados and Trinidad and Tobago have been increasing steadily. Flows to Barbados more than doubled, from US $68 million in 1996 to US$160 million in 2005. Remittances to Trinidad and Tobago increased from US$29.6 million in 1996 to US$97 million in 2005. It may be possible to establish a link between the rise in remittances to Barbados and Trinidad and Tobago and the increase in the number of highly skilled person emigrating to seek better paying opportunities abroad. The policy adopted by the government of Barbados to grant various concessions to returning migrants may have had an impact on the inflow of remittances, and consequently, may be directly responsible for the increased level of investments in the real estate sector.

Evidence also suggests (Table 4) that the flow of remittances into the majority of Caribbean islands in terms of size is greater than official capital received. Official capital as a source of finance has been on the decline but is still significant in countries such as Suriname, Haiti, Guyana, and Grenada. Additionally, the magnitude of remittance flows to Barbados, The Dominican Republic, Guyana, Haiti and Jamaica has been greater than FDI received. Remittances in terms of size, therefore represent an important and potential new source for development finance and economic growth in the region. Apart from the size of remittance flows to the region, the use of remittances as a source of development finance should be assessed in terms of the volatility of remittances when compared to FDI and official capital flows. Relatively stable inflows of remittances can provide a stabilising element during periods of financial instability.

Kirton and Mcleod (2006) however, point out various challenges that limit the development of remittances as a strong source of finance relative to private capital flows and official capital flows. They stress that the financial sector in many of the CARICOM countries is too thin, thus limiting the size of the inflows through the sector. Dixon (1997) infers a possible link between the increase in the flow of remittances and liberalisation in Jamaica in 1991, stating that it could partly be attributable to a switch in the methods of remitting, that is, from unofficial to official channels, as the number of remittance companies increase significantly in the 1990s. Kirton and Mcleod (2006) also mention the lack of a strong policy framework in the region to sustain migrant inflows. Policies exist in Jamaica, Guyana and Barbados but there is no specific stated policy which deals directly with attracting remittances to these countries. Weak remittances data collection, high transaction costs and uncompetitive market structures are also identified as other drawbacks inhibiting the flow of remittances as an alternative source of development finance.

4. Volatility Analysis

The average rolling five-year standard deviation of growth rates for remittances, FDI and official capital flows for each country are computed to give a measure of their volatility (see Blanchard and Simon, 2001 for a similar approach to measuring economic volatility). One of the drawbacks of this standard deviation measure is that it is sensitive to outliers and noise in the series. The use of the rolling average also tends to smooth out the fluctuations in the variable and gives a better view of the overall trend. From table 5, the size of the standard deviations indicate, that in 50 percent of the countries selected, official capital flows are the most volatile, followed by FDI in 29 percent of the countries and remittances (21 percent). The analysis also reveals that, remittances are less volatile than both official flows and FDI, particularly in those countries (Jamaica, Haiti, Dominican Republic, Barbados and Belize) where the magnitude of remittance flows and the proportion of remittances to GDP are significant. This is however, not the case for Guyana; remittance flows are reported to be more volatile than FDI and official capital flows. This may be a result of the absence of data on remittances in the earlier years of the study compared to the other capital inflows. The finding suggests that the flow of

remittances to these countries may be a sustainable source of inflow when compared to FDI and official capital flows.

5. Macroeconomic Determinants

According to Chami et al. 2003, the literature generally distinguishes two broad motives for remittances; an altruistic motive and an economic motive. Under the altruistic motive, the remitter is concerned about the welfare of dependents in his/her country and provides support through the remittances sent. With the economic motive, monies are sent either for investment purposes or to repay previously borrowed funds. The altruistic motive would depend largely on the income of the migrants and on the needs and income of the family in the native country, while the economic motive would be influenced primarily by the investment conditions in the native country relative to the host country. These motives are not mutually exclusive but can and do coexist in governing the remitter's reason for remitting funds to his/her home country (Becker (1991), Chami (1998), and Mulligan and Philipson (2000)). In this section, we follow the general approach in the empirical literature[2] and focus on the macroeconomic determinants that can be explained by either or both motives, and investigate whether or not they can explain remittances flows to the Caribbean.

Unfortunately, the lack of data limits the variables which could be examined. However, we believe that we are able to capture some of the key variables identified in the literature as most empirical analyses on the topic tend to include economic variables like income or inflation, financial variables such as interest rates, and demographic variables to capture family characteristics and ties (see, for example, the works by Banerjee (1984), Glytsos (1988), El-Sakka and McNabb (1999), Buch et al. (2002), Gupta (2005), and Chami et al. (2008)). As such, our model is specified as:

$$\left(\mathrm{Re}\,m/GDP\right)_{it} = \alpha_{it} + \beta_1(r_i - r_{US})_t + \beta_2(y_{US} - y_i)_{it} + \beta_3\pi_{it} + \beta_4\Delta REER_{it} + \beta_5 DR_{it} + \varepsilon_t$$

[2] For a critical review of the empirical literature see Chami et al. (2008).

where *Rem/GDP* is remittances as a ratio to GDP, *r* is the real interest rate, *y* is real GDP per capita adjusted for purchasing power parity, π is the domestic inflation rate, $\Delta REER$ is the percent change in the real effective exchange rate where an increase represents a depreciation of the local currency relative to the U.S. dollar, and *DR* is the dependency ratio. The remittance to GDP and the income differential variables are in logarithmic form, while the possibility of negative values in the other series precludes such a transformation.

The *real interest rate differential* is intended to capture the attractiveness of the native country for investment. The impact of this variable on remittances should be positive, as one would expect that remittances are driven by economic opportunities would increase as the real interest differential widens in favour of the remittance-receiving country.

The *real GDP per capita differential* is included as a proxy for the general state of the development of the native country relative to the host country and is commonly used to reflect the altruistic motive to remit (Schiopu and Siegfried (2006) and Chami et al. (2008)). Hence, we expect a positive coefficient, as a widening of the income gap should lead to an increase in remittances as a ratio to GDP.

The domestic *inflation* rate captures the degree of macroeconomic instability. However, its expected effect on remittances is ambiguous. On one hand, an unstable macroeconomic environment creates incentives to migrate abroad, which, ceteris paribus, should have a positive impact on remittances. Additionally, high inflation environment negatively affects the income of the migrant's family in the native country and thus remittances may increase because of the altruism motive. However under the economic motive, a higher inflation environment also reduces the expected rate of return on any monies remitted and thus would impact negatively on remittances.

The impact of the *real effective exchange rate* is likely to be positive as a real depreciation would raise the local purchasing power of remitted funds and thus render remittances more profitable. In addition where a parallel foreign exchange market exist, a real depreciation caused by a devaluation of the nominal exchange rate, will reduce the difference between the parallel and

official rates and thus make it more attractive for migrants to remit through official channels. This will increase the flow of official (recorded) remittances, other things remaining constant. However, as noted in Chami et al. (2008), the migrant may choose to remit less since the lower amount in the host country's currency might still represent an equivalent or greater purchasing power when converted into native country's currency.

The inclusion of the *age dependency ratio* is to capture the strength of family ties. This variable should have a positive impact on remittances since the higher ratio of dependents the greater the need for remittances.

5.1. Methodology and data

We utilise cross-sectional time-series data on 15 Caribbean countries for the period 1987 to 2005, gathered from the International Monetary Fund's International Financial Statistics Database (2007) and the World Bank's World Development Indicators Database (2007). Real interest rate is the 3-month deposit rate adjusted for inflation as measured by the GDP deflator, real GDP per capita is real gross domestic product converted to international dollars using purchasing power parity rates, inflation is the annual percentage change in the consumer price index, the real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator, and finally, the age dependency ratio is the ratio of dependents (people younger than 15 or older than 64) to the working-age population (those between the ages of 15 and 64).

The model estimates are derived using panel feasible GLS with cross-section weights in order to account for cross-section heteroscedasticity and autocorrelation in the data. We also include the lag dependent variable to allow for the kind of persistent that is evident in the data on remittance flows. The choice of a random-effects model versus a fixed-effects model is based on a Hausman test. The null hypothesis that the random effects are uncorrelated with the explanatory variables is rejected at the 1 percent level (the Hausman statistic is 31.42 with p-value of 0.000), implying that a fixed-effects model is the better specification. The results are reported in Table 6 and summarised below.

5.2. Results

Interest rate differentials are a highly significant determinant of remittances in Caribbean countries, where a widening of the real interest rate gap in favour of a Caribbean country leads to an increase in remittance flows to that country. As discussed above, the positive coefficient on the real interest rate differential suggests that remittance flows to the region behave similar to opportunistic capital flows. This provides evidence in favour of the economic motive for remitting funds.

The results also show that the income differential between host and respective Caribbean countries is a positive and significant determinant of remittances, which is indicative of an altruistic motive to remit. Thus, the lower the income of a respective Caribbean country relative to the host country (proxied by income in the U.S.), the higher is the flow of remittances. In other words, increases in the remitter's income (proxied by the host country's income) or decreases in income of the remitter's family (proxied by domestic income) lead to greater remittances. Our findings also suggest that with respect to the impact of inflation, the altruistic motive wins out and thus we have a positive effect whereby high inflation encourages greater flows to the region.

The dependency variable is significant and positively signed, which also lends support to the altruistic motive for funds remitted to the Caribbean. The results also indicate that remittances as a ratio to GDP is very relatively persistent and stable over time. The coefficient on the lagged dependent variable of 0.78 suggests that, all things being equal, a typical Caribbean country can expect in any given period to receive roughly 78 percent of the remittances received in the pervious period. Such a relatively high degree of persistence of remittances is reflective of the strong family ties that are characteristic of the Caribbean region and is consistent with the altruistic motive for remitting, which is predicated on the existence of a long-term binding relationship between the remitter and his/her family in the native country.

Finally the real effective exchange rate, though negatively signed, proved to be insignificant in explaining remittances flows to the region. However, when the model is re-estimated, replacing the changes real effective exchange with changes in the nominal exchange rate (ΔE), we find a

positive and significant impact. Thus, remittances tend to increase with the increase in the amount of domestic currency exchanged for a given amount of host country currency. Note that this result is only for the six floating rate countries in our sample, since the other nine countries had fixed rate regimes over the sample period and saw no devaluations.

6. Conclusion

Along with FDI and official capital flows, the inflow of remittances is an important source of finance in the Caribbean region. These flows have been used throughout the region primarily for various economic and investment activities, and are increasingly being considered as an alternative source of development finance to FDI and official capital flows. Remittances are the second-largest source, behind foreign direct investment for developing countries. However, this is not exactly the case in the Caribbean. The level of remittance inflows to Barbados, Jamaica, Guyana, Haiti, The Dominican Republic and Suriname is higher than that for FDI. The ratio of remittances to GDP is above 5 percent, thus emphasising its importance. The volatility of remittances when compared with the volatility of FDI and official capital flows, suggest that the inflow of remittances to these countries can be an alternative source of foreign finance. Given the size and volatility of the flows, the authorities in the aforementioned countries should look at implementing policies, which would directly target the mobilisation of remittances.

In this regard, our results suggest remittances flows to Caribbean countries governed by both altruistic and economic motives and as such the main macroeconomic determinants are the interest rate and income differentials between the host country and the home country, the domestic inflation, the ratio of dependents to the working population and changes in the nominal exchange rate. These findings lead naturally to certain policy implications and recommendations.

The first such implication is that if the governments in the region want to attract savings of nationals living abroad, savings that would otherwise have remained in the host country, it would be necessary to ensure that domestic interest rates remain sufficiently higher that those in the host country. Also, that there exist a range of financial instruments that such funds can be

invested in. In addition, the results suggest that a nominal exchange rate depreciation, which generally reduces the difference between unofficial and official rate, may also positively affect the flow of remittances. Thus, in those Caribbean countries where a significant gap exists between the official and unofficial exchange rates, the authorities may want to consider a nominal depreciation as an incentive for remitters to use the official market. The positive effect of the income differential is also quite informative from a policy perspective because it implies that as the per capita income of Caribbean countries increase relative to that of the host country, the local authorities can expect a falloff in the level of remittances. Thus, it will be necessary to for governments in the region to ensure that social safety nets of the respective countries keep pace with economic development (as proxied by income per capita) so as to make sure that the less fortunate of sociality are assisted.

Appendix: Tables

Table 1: Remittances US $M

Year	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Antigua & Barbuda	11.0	12.0	12.0	13.0	13.0	3.0	3.0	4.0	3.0	3.0
Belize	24.0	19.0	17.0	22.0	18.0	16.0	20.0	17.0	13.0	14.0
Dominica	8.0	12.0	16.0	13.0	14.0	5.0	5.0	4.0	3.0	3.0
Grenada	17.0	22.0	24.0	17.0	18.0	8.0	9.0	8.0	13.0	18.0
Haiti	105.0	113.0	124.0	123.0	61.0	70.0	70.0	73.0	43.0	109.0
Jamaica	112.0	121.0	154.0	209.0	229.0	181.0	216.0	239.0	522.0	653.0
St. Kitts & Nevis	11.0	11.0	12.0	19.0	19.0	1.0	1.0	2.0	2.0	2.0
St. Lucia	18.0	20.0	16.0	15.0	16.0	18.0	2.0	2.0	2.0	2.0
St. Vincent & Grenadines	14.0	15.0	15.0	15.0	16.0	2.0	2.0	2.0	2.0	2.0
Trinidad & Tobago	0.0	2.0	2.0	3.0	3.0	5.0	7.0	20.0	27.0	32.0
Barbados	11.0	28.0	32.0	32.0	38.0	45.0	54.5	55.4	57.2	60.9
Guyana	0.0	0.0	0	0.0	0.0	0.0	1.0	1.0	1.0	2.0
Dominican Republic	225.0	273.0	289.0	301.0	315.0	330.0	347.0	758.0	798.0	839.0
Suriname	2	2	3	2	1	4	5	4	0	0

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Antigua & Barbuda	3.3	6.4	3.4	3.4	3.3	3.3	11.1	26.7	16.9	17.7
Belize	24.4	27.8	31.2	32.2	51.6	41.2	29.0	73.0	77.0	81.0
Dominica	2.5	2.6	2.4	2.5	2.7	2.8	3.5	3.5	5.1	4.7
Grenada	20.3	18.2	18.5	19.4	20.1	20.4	24.7	25.2	48.1	29.6
Haiti	152.0	256.0	327.0	422.0	578.0	624.0	676.0	811.0	932.0	985.0
Jamaica	651.1	661.1	677.1	704.4	814.3	967.5	1229.0	1426.0	1497.0	1651.0
St. Kitts & Nevis	2.0	2.5	3.0	2.7	2.6	2.9	3.7	3.6	3.9	4.0
St. Lucia	1.5	1.5	1.6	1.9	2.6	2.4	4.0	4.3	3.1	2.2
St. Vincent & Grenadines	1.1	1.1	1.3	1.3	1.3	1.3	3.5	3.7	3.7	3.9
Trinidad & Tobago	29.6	31.6	47.9	56.2	40.6	49.3	59.0	88.0	93.0	97.0
Barbados	68.0	77.0	86.8	98.7	113.2	130.0	125.1	130.5	127.3	160.0
Guyana	41.0	40.0	44.0	39.0	47.0	44.0	119.0	137.0	143.0	270.0
Dominican Republic	963.0	1142.0	1406.0	1631.0	1839.0	1982.0	2195.0	2326.0	2501.0	2717.0
Suriname	0	0.1	0	2	0	0.2	15.1	23.5	21.3	21.4

Source: Central Bank of Barbados

Table 2: Remittances/GDP (%)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Antigua & Barbuda	3.6	3.6	3.3	3.4	3.3	0.8	0.7	0.9	0.7	0.7
Belize	9.1	6.4	5.3	6.0	4.4	3.8	4.5	3.6	2.7	2.8
Dominica	5.9	8.2	10.1	8.2	8.4	3.0	2.9	2.3	1.7	1.7
Grenada	9.9	11.5	12.1	8.1	8.1	3.5	4.0	3.6	5.8	7.8
Haiti	4.2	4.6	4.8	4.7	2.3	2.7	3.1	3.3	2.1	5.1
Jamaica	3.1	3.2	4.0	5.2	5.4	4.2	4.9	5.4	11.6	14.4
St. Kitts & Nevis	9.0	8.3	8.3	12.2	11.9	0.7	0.6	1.1	1.1	1.0
St. Lucia	5.4	5.9	4.1	3.6	3.7	4.1	0.4	0.4	0.4	0.4
St. Vincent & Grenadines	9.0	9.1	8.3	8.1	8.1	1.0	0.9	0.8	0.8	0.7
Trinidad & Tobago	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4	0.5	0.6
Barbados	0.7	1.7	1.9	1.8	2.2	2.7	3.6	3.6	3.6	3.7
Guyana	-	-	-	-	-	-	0.3	0.2	0.2	0.3
Dominican Republic	3.7	4.7	5.4	4.5	4.5	4.3	3.9	7.8	7.3	6.7
Suriname	0.20	0.18	0.23	0.36	0.25	0.91	1.24	0.92	0.00	0.00

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Antigua & Barbuda	0.7	1.3	0.7	0.6	0.6	0.6	2.0	4.5	2.7	2.7
Belize	4.8	5.3	5.8	5.6	8.4	6.4	4.3	9.9	10.0	10.2
Dominica	1.3	1.4	1.2	1.3	1.4	1.5	1.9	1.9	2.5	2.3
Grenada	8.4	7.1	6.7	6.5	6.3	6.8	8.1	7.7	15.3	9.3
Haiti	7.0	11.6	14.3	18.1	24.6	26.8	29.2	34.8	41.6	43.3
Jamaica	14.3	14.6	15.2	15.6	17.9	21.0	26.4	29.9	31.1	34.1
St. Kitts & Nevis	1.0	1.1	1.4	1.2	1.1	1.2	1.5	1.5	1.5	1.5
St. Lucia	0.3	0.3	0.3	0.4	0.5	0.5	0.8	0.8	0.6	0.4
St. Vincent & Grenadines	0.4	0.4	0.4	0.4	0.4	0.4	1.1	1.1	1.0	1.0
Trinidad & Tobago	0.5	0.5	0.7	0.8	0.5	0.6	0.7	0.9	0.9	0.9
Barbados	4.0	4.3	4.6	5.2	5.8	6.8	6.6	6.7	6.3	7.7
Guyana	5.6	5.1	5.9	5.5	6.4	6.1	16.0	17.8	17.8	33.8
Dominican Republic	6.8	7.6	8.9	9.4	9.3	9.2	10.2	14.2	13.6	9.3
Suriname	0.00	0.01	0.00	0.23	0.00	0.03	1.59	2.30	1.86	1.59

Source: Central Bank of Barbados

Table 3: Remittances/Exports (%)

Year	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Antigua & Barbuda	5.32	5.26	4.50	4.30	3.73	0.81	0.74	0.91	1.02	0.71
Belize	18.97	11.36	8.70	10.14	7.00	6.63	7.06	5.94	4.49	4.71
Dominica	13.51	18.10	20.54	18.26	15.66	5.37	5.12	4.09	3.00	2.69
Grenada	22.27	27.41	27.65	19.81	19.19	8.13	9.06	6.52	10.33	14.54
Haiti	31.34	33.39	36.07	34.34	12.15	9.62	50.98	48.96	33.30	42.83
Jamaica	8.32	7.90	9.22	10.88	10.38	8.78	9.81	10.31	20.61	22.23
St. Kitts & Nevis	19.02	15.91	15.97	23.99	23.06	1.03	0.89	1.73	1.65	1.69
St. Lucia	10.77	11.07	6.68	6.00	5.55	5.97	0.62	0.60	0.59	0.53
St. Vincent & Grenadines	14.99	16.40	12.00	12.95	12.26	1.78	1.45	1.68	1.78	1.47
Trinidad & Tobago	-	0.12	0.11	0.16	0.13	0.23	0.30	0.99	1.18	1.12
Barbados	1.48	4.20	4.26	3.73	4.52	5.62	6.21	5.84	5.73	5.29
Guyana	-	-	-	-	-	-	0.21	0.19	0.18	0.32
Dominican Republic	15.90	17.46	15.19	15.31	17.15	17.77	18.16	15.96	15.23	14.64

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Antigua & Barbuda	0.81	1.44	0.73	0.71	0.72	0.75	2.58	5.75	3.34	3.10
Belize	7.61	8.05	8.61	7.76	11.70	9.29	5.92	13.86	14.39	13.25
Dominica	2.05	1.90	1.58	1.59	1.87	2.31	2.84	2.96	3.92	3.73
Grenada	15.43	12.77	11.31	8.71	8.53	10.36	14.11	13.95	25.71	19.81
Haiti	45.17	75.52	87.90	84.27	124.24	143.90	173.40	177.22	190.01	166.13
Jamaica	22.78	22.62	21.70	22.05	23.79	30.77	40.22	42.86	39.60	41.36
St. Kitts & Nevis	1.64	1.71	1.94	1.89	1.73	1.89	2.42	2.19	1.97	1.90
St. Lucia	0.42	0.42	0.42	0.50	0.69	0.73	1.26	1.11	0.68	0.45
St. Vincent & Grenadines	0.74	0.75	0.83	0.74	0.73	0.74	1.96	2.14	2.01	2.04
Trinidad & Tobago	1.00	1.02	1.64	1.65	0.84	1.00	1.29	1.50	1.31	1.10
Barbados	5.63	6.20	6.92	7.80	8.81	10.09	10.14	9.60	9.17	8.86
Guyana	5.66	5.36	6.39	5.82	6.86	6.65	17.75	20.56	18.99	38.68
Dominican Republic	15.55	16.17	18.79	20.42	20.51	23.63	26.65	26.02	26.49	27.02

Source: Central Bank of Barbados

Table 4: Flows US $M

Country	Type of Flow	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Antigua and Barbuda	FDI	22.6	38.6	33.0	43.1	60.6	54.8	20.1	15.4	25.2	33.4
	Remittances	11.0	12.0	12.0	13.0	13.0	3.0	3.0	4.0	3.0	3.0
	Official Flows	5.1	5.6	8.5	4.3	4.6	7.2	4.7	3.0	4.0	2.3
Barbados	FDI	7.8	7.1	11.6	8.4	11.2	7.4	14.5	9.4	13.0	11.8
	Remittances	11.0	28.0	32.0	32.0	38.0	45.0	54.5	55.4	57.2	60.9
	Official Flows	3.7	6.1	2.9	2.0	2.6	2.1	0.0	3.6	(1.0)	(1.2)
Belize	FDI	4.6	6.9	14.0	18.7	17.2	13.6	15.6	9.2	15.4	21.1
	Remittances	24.0	19.0	17.0	22.0	18.0	16.0	20.0	17.0	13.0	14.0
	Official Flows	24.1	23.5	25.0	28.5	30.3	21.8	25.6	30.5	29.2	18.2
Dominica	FDI	5.2	13.5	11.9	17.2	12.9	15.2	20.5	13.2	22.6	54.9
	Remittances	8.0	12.0	16.0	13.0	14.0	5.0	5.0	4.0	3.0	3.0
	Official Flows	11.7	15.9	17.9	23.9	19.6	17.6	12.7	8.9	17.1	25.0
Dominican Republic	FDI	50.0	89.0	106.1	110.0	132.8	145.0	179.7	189.3	206.8	414.3
	Remittances	225.0	273.0	289.0	301.0	315.0	330.0	347.0	758.0	798.0	839.0
	Official Flows	91.8	129.0	118.1	143.3	101.7	67.7	65.6	(1.9)	61.3	119.4
Grenada	FDI	4.5	14.7	15.0	10.5	12.9	16.5	23.9	21.6	21.4	23.4
	Remittances	17.0	22.0	24.0	17.0	18.0	8.0	9.0	8.0	13.0	18.0
	Official Flows	23.9	19.1	20.0	14.7	13.8	16.5	12.9	7.9	18.2	10.8
Guyana	FDI	9.0	4.4	2.1	2.1	7.9	12.3	146.6	69.5	106.7	74.4
	Remittances	-	-	-	-	-	-	1.0	1.0	1.0	2.0
	Official Flows	29.9	27.6	27.0	44.0	168.3	129.4	89.8	106.3	78.5	85.7
Haiti	FDI	4.8	4.7	10.1	9.4	-	(1.8)	(2.2)	(2.8)	-	7.4
	Remittances	105.0	113.0	124.0	123.0	61.0	70.0	70.0	73.0	43.0	109.0
	Official Flows	180.6	212.9	141.7	196.0	167.4	177.3	101.0	120.7	599.8	722.2
Jamaica	FDI	(4.6)	53.4	(12.0)	57.1	137.9	133.2	142.4	77.9	129.7	147.4
	Remittances	112.0	121.0	154.0	209.0	229.0	181.0	216.0	239.0	522.0	653.0
	Official Flows	177.2	167.0	192.1	261.5	270.6	159.4	118.3	99.4	108.9	107.7
St. Kitts and Nevis	FDI	9.2	16.7	13.1	40.8	48.8	23.1	12.5	13.9	16.6	23.1
	Remittances	11.0	11.0	12.0	19.0	19.0	1.0	1.0	2.0	2.0	2.0
	Official Flows	5.5	7.5	14.1	13.4	8.1	7.5	8.1	10.8	4.7	3.9

Country	Type of Flow	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
St. Lucia	FDI	14.5	15.0	16.4	26.6	44.8	57.7	41.5	35.9	34.0	35.4
	Remittances	18.0	20.0	16.0	15.0	16.0	18.0	2.0	2.0	2.0	2.0
	Official Flows	11.7	10.7	18.0	18.7	12.3	23.1	27.1	25.6	27.5	48.2
St. Vincent & the Grenadines	FDI	7.4	5.0	9.1	10.6	7.7	8.9	14.4	31.4	47.4	30.6
	Remittances	14.0	15.0	15.0	15.0	16.0	2.0	2.0	2.0	2.0	2.0
	Official Flows	12.4	13.3	17.0	15.3	15.4	15.9	18.1	13.7	9.4	47.6
Suriname	FDI	(60.4)	(129.6)	(171.0)	(299.7)	(76.8)	18.5	(54.3)	(46.6)	(30.2)	(20.6)
	Remittances	2.0	2.0	3.0	2.0	1.0	4.0	5.0	4.0	-	-
	Official Flows	13.6	22.2	21.3	50.8	61.1	43.6	79.7	78.8	60.1	76.7
Trinidad and Tobago	FDI	(14.5)	33.1	62.9	148.9	109.4	169.3	177.9	379.2	516.2	298.9
	Remittances	-	2.0	2.0	3.0	3.0	5.0	7.0	20.0	27.0	32.0
	Official Flows	18.9	34.2	8.4	5.8	17.8	(2.2)	7.5	1.4	21.1	24.9

Country	Type of Flow	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Antigua and Barbuda	FDI	22.6	24.3	27.5	64.1	66.6	111.9	79.7	179.4	95.2	133.3
	Remittances	3.3	6.4	3.4	3.4	3.3	3.3	11.1	26.7	16.9	17.7
	Official Flows	3.9	4.3	9.9	10.7	9.8	8.6	14.0	5.3	1.6	7.2
Barbados	FDI	13.3	14.8	15.8	17.4	19.4	18.6	17.4	58.3	(12.1)	62.0
	Remittances	68.0	77.0	86.8	98.7	113.2	130.0	125.1	130.5	127.3	160.0
	Official Flows	4.2	4.3	15.7	(2.1)	0.2	(1.2)	3.3	19.7	28.8	(2.1)
Belize	FDI	16.6	12.0	17.7	53.6	23.3	59.9	24.3	(1.4)	127.6	126.1
	Remittances	24.4	27.8	31.2	32.2	51.6	41.2	29.0	73.0	77.0	81.0
	Official Flows	20.6	14.1	15.2	46.3	14.7	21.6	22.2	11.9	7.7	12.9
Dominica	FDI	18.7	22.0	9.0	19.1	20.4	20.6	20.7	31.9	27.5	32.2
	Remittances	2.5	2.6	2.4	2.5	2.7	2.8	3.5	3.5	5.1	4.7
	Official Flows	43.1	14.6	19.3	9.8	15.2	19.9	29.9	10.9	29.2	15.2
Dominican Republic	FDI	96.5	420.6	699.8	1,337.8	952.9	1,079.1	916.8	613.0	909.1	1,023.2
	Remittances	963.0	1,142.0	1,406.0	1,631.0	1,839.0	1,982.0	2,195.0	2,326.0	2,501.0	2,717.0
	Official Flows	99.5	71.0	118.2	189.6	56.1	106.9	144.9	68.8	84.5	77.0

Country	Type of Flow	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Grenada	FDI	18.9	36.0	49.9	43.0	39.4	60.8	57.4	90.5	66.3	73.3
	Remittances	20.3	18.2	18.5	19.4	20.1	20.4	24.7	25.2	48.1	29.6
	Official Flows	11.9	8.9	6.2	10.3	16.5	11.5	9.7	10.4	15.4	44.9
Guyana	FDI	59.0	52.0	44.0	46.0	67.1	56.0	43.6	26.1	30.0	76.8
	Remittances	41.0	40.0	44.0	39.0	47.0	44.0	119.0	137.0	143.0	270.0
	Official Flows	141.8	264.6	92.9	79.5	107.3	97.4	64.7	86.6	134.0	136.8
Haiti	FDI	4.1	4.0	10.8	30.0	13.3	4.4	5.7	7.8	5.9	9.5
	Remittances	152.0	256.0	327.0	422.0	578.0	624.0	676.0	811.0	932.0	985.0
	Official Flows	367.3	325.0	407.0	262.9	208.2	170.7	155.6	212.4	259.6	515.0
Jamaica	FDI	183.7	203.3	369.1	523.7	468.3	613.9	480.8	720.7	601.6	682.5
	Remittances	651.1	661.1	677.1	704.4	814.3	967.5	1,229.0	1,426.0	1,497.0	1,651.0
	Official Flows	57.8	71.8	19.2	(21.9)	10.0	54.0	24.0	5.1	77.6	35.7
St. Kitts and Nevis	FDI	37.7	25.8	33.4	59.6	99.0	90.3	81.1	77.9	53.1	104.3
	Remittances	2.0	2.5	3.0	2.7	2.6	2.9	3.7	3.6	3.9	4.0
	Official Flows	6.8	7.2	6.6	4.7	3.9	10.6	28.5	(0.1)	(0.1)	3.5
St. Lucia	FDI	21.0	51.4	86.0	86.5	58.2	63.0	57.2	111.8	81.0	82.0
	Remittances	1.5	1.5	1.6	1.9	2.6	2.4	4.0	4.3	3.1	2.2
	Official Flows	38.6	25.5	6.1	25.6	11.0	16.2	33.5	14.9	(21.6)	11.1
St. Vincent & the Grenadines	FDI	42.7	92.7	89.0	56.8	37.8	21.0	34.1	55.2	66.1	42.1
	Remittances	1.1	1.1	1.3	1.3	1.3	1.3	3.5	3.7	3.7	3.9
	Official Flows	26.3	5.9	20.5	16.3	6.2	8.6	4.8	5.7	10.5	4.9
Suriname	FDI	19.1	(9.2)	9.1	(61.5)	(148.0)	(26.8)	(73.6)	(76.1)	(37.3)	27.9
	Remittances	-	0.1	-	2.0	-	0.2	15.1	23.5	21.3	21.4
	Official Flows	109.1	76.2	58.8	35.0	34.3	23.2	11.6	10.9	23.9	44.0
Trinidad and Tobago	FDI	355.4	999.4	729.8	643.3	679.5	834.9	790.7	808.3	1,098.1	1,100.0
	Remittances	29.6	31.6	47.9	56.2	40.6	49.3	59.0	88.0	93.0	97.0
	Official Flows	16.5	33.0	13.8	26.2	(1.5)	(1.7)	(8.6)	(3.1)	(2.0)	(2.1)

Source: Central Bank of Barbados

Table 5: Average Rolling Standard Deviation

	Remittances	FDI	Official Capital Flows
	Standard deviations (variables in % of GDP)		
Antigua and Barbuda	0.564	0.483	0.513
Barbados	0.103	0.502	2.66
Belize	0.301	5.704	0.469
Dominica	0.251	0.557	0.545
Dominican Republic	0.195	0.544	4.876
Grenada	0.278	0.326	0.415
Guyana	0.782	0.324	0.51
Haiti	0.285	10.08	0.406
Jamaica	0.186	0.952	0.831
St. Kitts and Nevis	0.554	0.454	1.24
St. Lucia	0.481	0.38	0.764
St. Vincent and the Grenadines	0.512	0.473	0.706
Suriname	2.982	2.229	0.487
Trinidad and Tobago	0.377	0.551	1.703

Source: Central Bank of Barbados

Table 6: Determinants of Remittances

	Log (Rem/GDP)	Log (Rem/GDP) "without ΔREER"	Log (Rem/GDP) "with ΔE"
Constant	4.957*** (6.029)	4.905*** (5.874)	3.987*** (3.850)
Log (Rem/GDP) $_{t-1}$	0.785*** (22.817)	0.785*** (22.95)	0.779*** (22.26)
(r $_{i}$ **-r** $_{US}$ **)**	0.016*** (7.982)	0.015*** (6.174)	0.015*** (6.852)
Log (Y $_{US}$ **-Y** $_{i}$ **)**	1.298*** (6.025)	1.287*** (5.897)	1.048*** (3.826)
Π	0.006*** (6.602)	0.006*** (3.459)	0.003*** (3.146)
Log (DR)	0.376** (2.539)	0.342** (2.229)	0.331** (2.212)
Δ**REER**	-0.003 (-0.928)		
Δ**E**			0.023*** (3.850)
Number of Countries	14	14	14
Number of Observations	233	233	233
R ^{2}	0.941	0.941	0.943
Adj R ^{2}	0.935	0.936	0.938
DW	2.064	2.069	2.078

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