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DIASPORA REMITTANCES AND INVESTMENT: A DERIVATION AND MEASUREMENT

Dr C Kenrick Hunte

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Diaspora Remittances and Investment: A Derivation and Measurement

Dr. C. Kenrick Hunte

Abstract

This paper provides a theoretical framework and empirical evidence for assessing the impact remittances have on investment, saving, the interest and exchange rates in a small, open economy. The model shows that remittance inflows result in a currency that appreciates as the interest rate decreases, while the evidence confirms that remittances have a positive impact on investment. A poor business environment, the lack of corruption control and the absence of the rule of law can decrease investment. Commonwealth countries have a propensity to save and invest at relatively higher levels than other countries in the study; and political stability and the rule of law enhance this process. Remittances, however, reduce savings, making the country more remittance-dependent. Policy makers should therefore provide incentives that increase the use of remittances in investments that emphasize employment opportunities, and offer attractive medium and long term saving instruments to forestall the impact of a currency-appreciation.

*Associate Professor and Director of Graduate Studies, Department of Economics, Howard University. USA

Introduction

Diaspora remittances represent a new approach to development that is driven by individual and collective choice of migrants (Stark and Bloom 1985). In particular, it reflects peoples' willingness to migrate from their country of origin for the purpose of building a diversified income stream to mitigate risk and enhance the wellbeing of their friends and family in their country of origin. Recent survey evidence shows that remittances are the second largest source of financing behind foreign direct investment for African developing countries (Dilip Ratha and Ani Silwal 2012). In addition, anecdotal evidence seems to suggest that remittances may promote capital and knowledge transfers in ways that can build capacity and enhance development.

This form of altruistic behavior from migrants to non-migrants was not contemplated as part of early migration theory, where it was posited that migration ends when wages are equalized in the country of origin and the country of destination (Lewis 1954; Ranis and Fei 1961; Harris and Todaro 1970; Massey and others, 1993; Hein de Hass, 2008). Furthermore, while there was no consideration for remittances being included in migration models (Djajic 1986; Taylor 1999), migration theory asserted that only utility maximizing behavior of individuals mattered and not the collective preferences of households, or social groups and communities.

Challenges to this view have come from several researchers (Stark and Bloom 1985; Katz and Stark, 1986; Taylor 1986; Stark 1991). They argue that migration decisions are made not by one individual, but by families and households. Specifically, they claim that the household's objective is not only to maximize income, but to minimize risk and contain the negative effects of market failure which may leave many unemployed without income. For example, in developed countries support mechanisms for mitigating risk are provided through private markets and government programs. In private markets, there are insurance products that can be used to offset the negative effects of natural disasters or there are futures contracts to cover price risks (Ritter and others 2009). Government in developed countries provide safety-net programs, including unemployment insurance, retirement and health services, among other publicly funded activities. In contrast, developing countries may not have sufficient insurance coverage or safety-net programs to deal with natural disasters; and more often than not, there may be a lack of financial instruments or financial institutions geared to address these concerns. Besides,

government safety-net programs are either underfunded or do not exist. Consequently, migrant remittances become critical for sustaining household consumption, as it provides an insurance mechanism employed to deal with adverse events that affect families (Massey and others, 1993).

Equally important is the view by some researchers that remittances are mainly used for consumption and not for investment purposes, implying that economic growth would not be facilitated with the use of remittances and concluding that migration does not enhance development because remittances are spent in unproductive activities (Rubenstein 1992; Reichert 1981). Ratha and others (2011), however, have shown in a cross-country study in Africa that benefits accrue from remittance inflows at the micro and macro levels. They assert that at the macro level, remittances are the second largest and most stable inflow of foreign exchange into Africa. It is often countercyclical, offsetting economic downturns while improving sovereign creditworthiness. At the micro level, they argue that remittance inflows reduce poverty, increase spending on health and education, and substitute for the sale of productive assets, such as livestock, when there are food shortages.

Furthermore, household survey evidence compiled by Mohapatra and Ratha (2011) from selected African countries (Burkina Faso, Kenya, Senegal and Uganda) show that not only are remittance inflows used for consumption purposes, but it is also used for investment goods (Table 1). Their survey shows that consumption on the average absorbs 76.1 percent of domestic remittances, with a high of 95 percent in Senegal and a low of 53 percent in Kenya, and with most of it being used for food and health care expenditures. Of the 23.9 percent that is allocated to investment, most is disbursed on the average for education (13.7 percent) and for business (4.4 percent).

	Burkina Faso	Kenya	Senegal	Uganda	Average
Food	48.7	29.7	81.9	12.4	43.2
Health	12.5	7	2.9	24.8	11.8
Clothing	0.7	0	0	0	0.2
Marriage/Funeral	3.1	2	1.1	1.7	2.0
rent (house/Land)	1.7	7.4	2.2	4.5	4.0
Other	16.3	6.9	6.9	29.8	15.0
Total Consumption	83	53	95	73.2	76.1
New House Construction	2.6	1.3	0	0.4	1.1
Education	9.4	20.5	4.6	20.2	13.7
Business	2.4	13	0.2	2.1	4.4
House Rebuilding	1.2	1.3	0.1	2.1	1.2
Cars and Trucks	0.1	0.4	0	0	0.1
Land Purchase	0.1	1.3	0	2.1	0.9
Farm Improvement	1.1	4.4	0	0	1.4
Investment	0	4.7	0	0	1.2
Total Investment	16.9	46.9	4.9	26.9	23.9
Total Expenditure	100	100	100	100	100.0

Source: Mohapatra and Ratha (2011), 'Remittance Markets in Africa,' pp.20.

What is important about this information is the wide distribution in the share of remittances that are allocated to investment across these countries. The evidence shows that it ranges from a low of 4.9 percent in Senegal to high of 46.9 percent in Kenya. Some of the differences between Kenya and Senegal perhaps could be explained by the business environment as reported in the 2011 Doing Business Survey (IFC 2012). Specifically, Kenya is ranked more favorably at position 105 as compared with Senegal with a rank of 154, indicating a less favorable business environment in Senegal than in Kenya.

Purpose of the Paper

The purpose of this paper is to provide a plausible theoretical framework for assessing the impact remittances have on a small, open economy and to ascertain whether or not remittances and policy indicators have an impact on savings and investment. This is important because knowing what may cause investment to increase in the presence of remittances can catalyze the

development process, once measures are taken to minimize the ‘Dutch Disease’ effects as exemplified through the appreciation of the exchange rate. Another issue in this paper is the view that there can be work-ethic distortions, if remittances are seen as permanent income, resulting in remittance dependency (Hunte 2004). This phenomenon is observed due to an inverse relationship between savings and remittances such that when remittances increase, savings decrease. This paper examines this issue and it also examines the saving and investment behavior in the presence of remittances in Commonwealth countries, relative to other developing countries. The remaining sections of this paper are as follows. The next section contains a description of the model that represents a developing country in which remittances are important in gross domestic product. Thereafter, the data used in the study will be presented, followed by the estimation results and concluding remarks.

The Model

The proposed model is based on the macroeconomic framework of a small, open economy.¹ It is assumed that the small country, called Progressna, operates as a price taker in all markets, except in capital and foreign exchange markets. Specifically, capital and foreign exchange do not flow freely across borders, due to government restrictions and underdeveloped financial institutions and instruments, resulting in the existence of foreign exchange shortages and an unofficial market for foreign exchange. The currency used in Progressna is referred as P dollars (P\$) and it is assumed that output for the economy is based on a short run production function:

$$Y = RL^\alpha \quad 0 < \alpha < 1 \quad (1)$$

where Y is output; K is capital (fixed); and L is labor. Because of poverty, low per capita income, and the notion that a significant share of income is allocated to consumption in Progressna, it is assumed that consumption (C) is equal to the real wage (w/P) times the quantity of labor (L) provided by the household, plus the share of remittances (R) that is spent on consumption. Consumption is therefore specified as:

$$C = \frac{w}{P}L + \beta Re \quad 0 < \beta < 1 \quad (2)$$

¹ The model is based on a modification of Mankiw (2009) framework for a small open economy. It also draws on an approach used by Hunte (2011).

with e being the nominal exchange rate and Re being the equivalent value of US\$ in Progressna country's currency. With the marginal product of labor (MPL) equal to the real wage (w/P), the consumption function, which is proportional to income and remittances, can be written as:

$$C = \alpha Y + \beta Re \quad 0 < \alpha, \beta < 1 \quad (3)$$

Investment (I) is assumed to be inversely related to the real interest rate (r), with the equation for the economy being specified as:

$$Y + Re = C + I(r) + NX \quad (4)$$

where NX is a function of the exchange rate and is the difference between export and imports. Noting that income (Y) minus consumption (C) is equal to saving (S) which is positively related to the interest rate, equation 4 can be rewritten as:

$$S(r) + Re - NX = I(r) \quad (5)$$

When net-exports and remittances are zero, this implies that saving is equal to investment, with the initial equilibrium with no remittances occurring at interest rate r_1 and savings (S) equal to investment (I) (Figure 1). The exchange rate is e_1 and equilibrium in the money

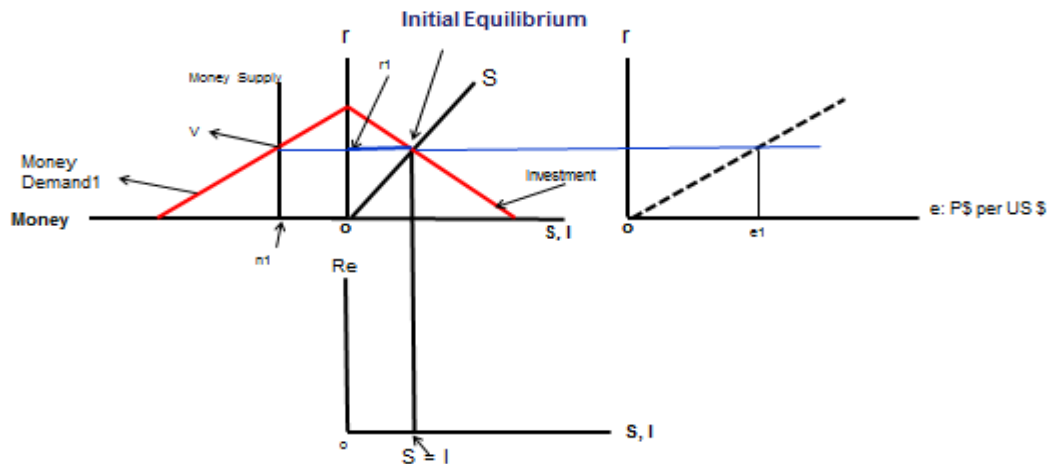


Figure 1: Initial Equilibrium at $S = I$ when interest rate is r_1 and exchange rate e_1 with money supply equal money demand at V , and remittances zero.

Market is at r_1 and n_1 . Adding remittances in the model shifts the savings curve to the right, yielding a lower interest rate (v_1), a new equilibrium investment level at d , with the money supply and demand at n_2 and the exchange rate e_2 , representing an appreciation of the Progressna currency and the ‘Dutch Disease’ (Figure 2).

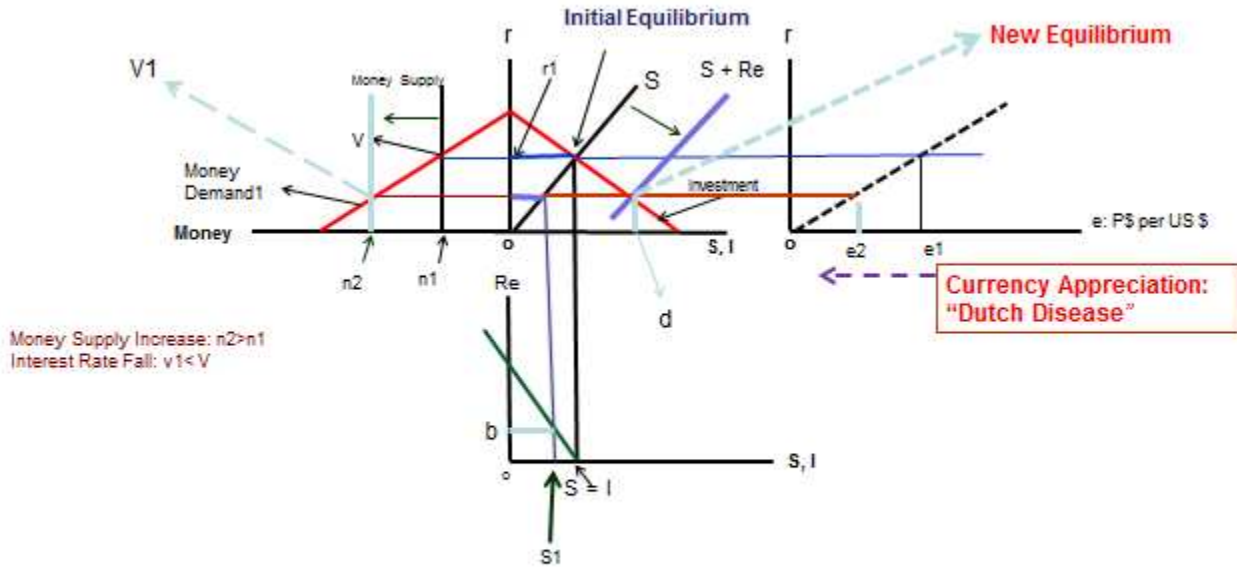


Figure 2: Initial Equilibrium at $S = I$ when interest rate is r_1 and exchange rate e_1 with money supply equal money demand at V , and remittances zero.

As remittances increase from zero to a positive amount (b), the inverse relationship is observed between saving and remittances. The new level of investment (d) is financed by remittances ($d - S_1$) and domestic saving (S_1). More importantly, savings decrease from S to S_1 after the introduction of remittances, indicating a measure of remittance dependency.ⁱ In order to observe the investment demand curve, substitute equation 3 into equation 4 to yield investment as a function of income and remittances:

$$I = (1-\alpha)Y + (1-\beta) Re \quad (6)$$

This result confirms that investment is proportional to income and remittances. Furthermore, adding equation 6 to equation 3 yields an identity: $C + I = Y + Re$; and noting that $Y - C$ is equal to savings (S), the saving function can be specified as:

$$S = (1-\alpha)Y - \beta Re \quad (7)$$

which confirms that saving (S) is proportional to income and inversely proportional to remittances (Re). Finally, it can be observed that saving (S) will only equal investment (I), if remittance (Re) is zero, thereby supporting the results observed in Figure 1.

Dividing equation 6 by Y generates a model showing that the investment-income ratio is proportional to the remittance-income ratio, with $1-\alpha$ being an intercept term that could be specified in a manner that captures business and political indicators:

$$\frac{I}{Y} = (1 - \alpha) + (1 - \beta) \frac{Re}{Y}, \quad (8)$$

With

$$(1-\alpha) = \lambda + f(\text{business and political indicators (BPI)}) \quad (9)$$

$$\frac{I}{Y} = \lambda + (BPI)\varphi + (1 - \beta) \frac{Re}{Y}. \quad (10)$$

Data

The data in the study is obtained from several sources, including the World Bank, International Financial Corporation (IFC), EconStats, Commonwealth Secretariat and Wikipedia. The sample consists of 148 countries of which thirty-nine are from Africa, twenty-six are from the Americas, thirty-seven from Asia and Oceania, and forty-six from Europe (Appendix 1 has a list of the countries). The sample also includes 36 Commonwealth countries, eighteen of which are in Africa (Table 1). Using the human development ranking index, the sample shows that thirty-seven countries are in the very high human development (VHHD) category, with twenty-nine of them in Europe and an additional five and three others, respectively, in Asia and Oceania, and the Americas.

Table 1: Number of Countries Categorized by the Human Development Ranking 2011						Number of Commonwealth and Other Countries	
Country Groups	VHHD	HHD	MHD	LHD	Total	Commonwealth	Other
Africa	0	2	9	28	39	18	21
Americas	3	13	9	1	26	5	21
Asia & Oceania	5	7	18	7	37	10	27
Europe	29	14	3	0	46	3	43
Total	37	36	39	36	148	36	112

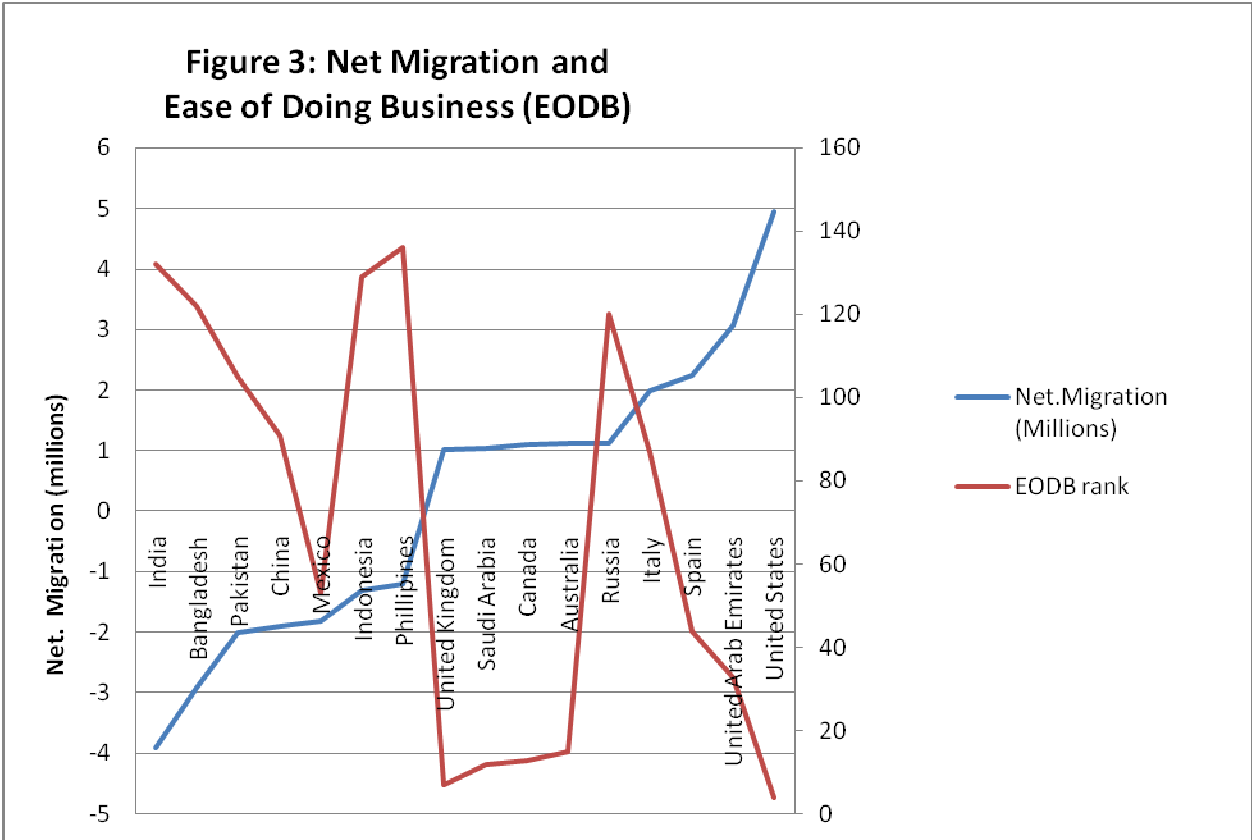
Source: Derived from the Human Development Report 2011 and the Commonwealth website.

Africa has no VHHD countries, but accounts for twenty-eight of the thirty-six countries in the low human development (LHD) category. There are no LHD countries in Europe, with the remaining eight LHD countries in Asia and Oceania (seven) and one in the Americas. Not surprising is the outcome that Africa emerges as the most in need of development, with commonwealth countries accounting for a significant number them (18 out of 39). Net migration could generate positive or negative increases in population movements or a neutral position in population changes. Of the 148 countries in the sample, fifty-five had positive net migration activities that increased the population (Table 2). Thirty European countries welcomed migrants, but the United States remained the most preferred county for net migration, absorbing an estimated at 4.9 million persons during the period 2006 to 2010. The next largest is the United Arab Emirates (3.1million), followed by Spain (2.3 million), Italy (2.0 million) and the Russian Federation (1.1 million). There were eighty-six countries in the net-negative migration category, with the highest recorded outflows from India of 3.0 million, followed by Bangladesh (2.9 million), Pakistan (2.0), China (1.9 million) and Mexico (1.8 million). There are also seven countries with zero net migration changes; these countries are Estonia, Djibouti, Mauritius, Papua New Guinea, Solomon Islands, Serbia, and Korea.

Table 2: Net Migration by Geographic Distribution				
Country Grouping	Positive	Neutral	Negative	Total
Africa	9	2	28	39
America	5	0	21	26
Asia & Oceania	11	3	23	37
Europe	30	2	14	46
Total Countries	55	7	86	148

Source: Derived from: World Bank <http://data.worldbank.org/indicator/SM.POP.NETM>

Figure 3 contains information on net migration data for countries with over one million positive or negative migrant flows and their corresponding rank in the easy of doing business index obtained from the IFC.



The data show that these two measures are inversely related, implying that as the business environment becomes less favorable to business development and expansion, more people leave their country of origin, generating a negative migration rate as they seek employment opportunities elsewhere. For example, India and Bangladesh have the highest negative migration levels, but they also rank among the lowest for doing business. The opposite is true for the United States of America where the United States has the highest positive net migration and is ranked near the top in doing business. This evidence supports international migration theory in which wage differentials cause low wage workers to move to high wage countries (Lewis 1954; Ranis and Fei, 1961; Harris and Todaro 1970). This evidence also implies that policies aimed at improving the business environment can reduce migration as workers are presented with an additional option before they decide to migrate.

Results:

Based on the model and the graphs in Appendix 2 in which it is shown that saving and remittances are inversely related, Table 3 contains the results obtained from using ordinary least squares to estimate four different saving equations. The estimated coefficient for remittances as a share of GDP in all four equations are negative and statistically significantly different from zero at the 10, 5 and 2.5 percent levels, confirming that as remittances as a share of GDP increases, savings as a share of GDP decreases.

Table 3: Regression Results: Dependent Variable— Savings as a Share of GDP				
	Model 1	Model 2	Model 3	Model 4
Remittance/GDP	-0.265** (0.14)	-0.245* (0.15)	-0.329*** (0.14)	-0.332*** (0.14)
Asia &Oceania	--	0.057**** (0.02)	0.054**** (0.02)	0.054 **** (0.02)
Age	--	0.003*** (0.001)	0.005**** (0.001)	0.005**** (0.001)
Commonwealth (CW)	--	0.282** (0.13)	0.458**** (0.14)	0.456**** (0.14)
Age * CW	--	-0.004**** (0.001)	-0.009**** (0.002)	-0.009**** (0.002)
Political Stability (PS)	--	-0.038 (0.04)	-0.051 (0.06)	-0.018 (0.10)
CW*PS	--	--	0.251**** (0.10)	0.247**** (0.10)
Very High Human Development (VHHD)	---	---	-0.054** (0.02)	-0.051** (0.03)
Rule of Law (ROL)	--	--	---	-0.03 (0.08)
Intercept	0.230**** (0.01)	-0.01 (0.01)	-0.13 (0.10)	-0.132 (0.11)
Observations	135	135	135	135
Adjusted R-Square	0.01	0.11	0.17	0.17

Note: *, **,***, and **** show significance at the 10, 5, 2.5 and 1 percent levels; standard error in the bracket.

The results also confirm that savings rates in Asia and Oceania are higher than saving rates elsewhere, as the estimated coefficients are positive and statistically significantly different from zero. Likewise, the coefficients for age and the commonwealth are positive and statistically different from zero, indicating that savings are positively influenced by an ageing population and by the presence of migrants from Commonwealth countries, relative to other countries. Countries in the very high human development (VHHD) category tend to save less than other countries, since the estimated coefficient is negative and statistically different from zero. An explanation for this outcome could be that countries in the VHHD category save less since they have social

safety-nets and risk mitigating mechanisms that reduce risk exposure in an economic down turn. While the estimated coefficients for political stability are not statistically significant, the interaction term that cross multiplies political stability with the Commonwealth is positive and statistically significantly different from zero, indicating that political stability in Commonwealth countries tend to generate higher saving levels when compared with other countries. In contrast, the interaction term for age and the Commonwealth is negative and statistically significantly different from zero, suggesting that as age increases in Commonwealth countries the population tend to save less, relative to other countries.

Table 4 contains the estimated results from the model in equation 9. The estimated coefficient

Table 4: Regression Results: Dependent Variable— Investment as a Share of GDP				
	Model 1	Model 2	Model 3	Model 4
Remittance/GDP	0.231**** (0.09)	0.240**** (0.10)	0.186** (0.09)	0.200*** (0.09)
Africa (AF)	--	0.053**** (0.02)	0.057**** (0.02)	0.067**** (0.02)
Age	--	0.004**** (0.001)	0.004**** (0.001)	0.005**** (0.001)
Commonwealth (CW)	--	0.157* (0.10)	0.116 (0.10)	0.169** (0.10)
CW* ROL	--	0.196**** (0.07)	0.197**** (0.06)	0.223**** (0.06)
CW*Age		-0.003*** (0.001)	-0.003** (0.001)	-0.004**** (0.001)
Rule of Law (RoL)	--	-0.09**** (0.03)	-0.202**** (0.04)	-0.069 (0.08)
Ease of Doing Business (EoDB)	--	1.16E-05 (0.0001)	-0.0006**** (0.0002)	-0.0006**** (0.0002)
RoL *EoDB	--	--	0.001**** (0.0004)	0.001**** (0.0004)
Control of Corruption (private power over the state)	--	--	--	-0.150**** (0.06)
High Human Development	--	--	--	-0.003 (0.01)
Intercept	0.208**** (0.007)	-0.111 (0.11)	-0.019 (0.11)	-0.068 (0.11)
Observations	148	148	148	148
Adjusted R-square	0.03	0.08	0.15	0.18

Note: *, **, ***, and **** show significance at the 10, 5, 2.5 and 1 percent levels; standard error in the bracket.

in all four models for remittances as a share of GDP is positive and statistically significantly different from zero at the 5, 2.5, and 1 percent levels, confirming that as remittances as a share of GDP increases, investment as a share of GDP increases. The estimated coefficient for the ease of

doing business is negative and statistically different from zero in models 3 and 4, signaling that as the investment climate becomes progressively worse, less investment is undertaken. While the estimated coefficients for the rule of law are negative and statistically significantly different from zero (model 2 and 3), a somewhat surprising result, it is the interaction term between the rule of Law and the ease of doing business that is interesting. This interaction term is positive and statistically different from zero, implying that it acts as a modifier, reducing the negative effects a poor business environment and the possible laxity in the rule of law. The estimated coefficients for the rule of law and the commonwealth are positive and statistically significantly different from zero, indicating that investment is higher in the Commonwealth when compared with other countries. Likewise, the estimated coefficient for Africa is positive and statistically significantly different from zero, indicating that investment as a share of income is higher in Africa (22.1 percent) when compared with other countries. The descriptive data in the study confirms this outcome where investment as a share of income in Africa is 22.1 percent as compared with a share of 21.7 percent in other countries.

Applying the coefficients from Model 1 (Table 4) in the estimated investment (I) and consumption (C) functions (equations 6 and 3) it is observed that as:

$$I = 0.208Y + 0.231Rem \quad (10)$$

$$C = 0.792Y + 0.769 Rem \quad (11)$$

$$Saving = 0.230 Y - 0.229 Rem \quad (12)$$

An interesting comparison is observed from the results obtained in the study. First, the change in investment with respect to a change in remittances in equation 10 is 23.1 percent. When compared with the survey information, this value is close to the share of investment- remittances in the African survey of 23.9 percent (Table 1). Likewise, the change in consumption with respect to a change in remittances is 76.9 percent and this result is also close to the consumption-remittance ratio in the African survey is 76.1 percent in Table 1.

Concluding Remarks

This paper provides a theoretical framework and empirical evidence for assessing the impact remittances have on investment, saving, the exchange rate and the interest rate in a small, open economy. The model shows that remittance inflows result in the appreciation of the currency as the interest rate decreases, while the evidence confirms that remittances have a positive impact on investment. The evidence shows that a poor business environment, the lack of corruption control and the absence of the rule of law can decrease investment opportunities. The evidence also supports the notion that Commonwealth countries have a propensity to save and invest at higher levels than other countries in the study; and that political stability and the rule of law enhances this process.

It should be noted, however, that remittances reduce domestic savings, making the country more remittance-dependent. This outcome can undermine the work ethic, if remittances are seen as permanent income and used mainly for consumption, instead of investment goods. In order to address these concerns policy makers should provide incentives aimed at increasing the use of remittances in investments and especially those investments that provide employment opportunities, forestalling remittance dependency. Policy makers should also reduce the impact of the appreciating currency which can negatively affect export competitiveness. This can be achieved by providing attractive medium and long term saving incentives and saving instruments that could include diaspora bonds.

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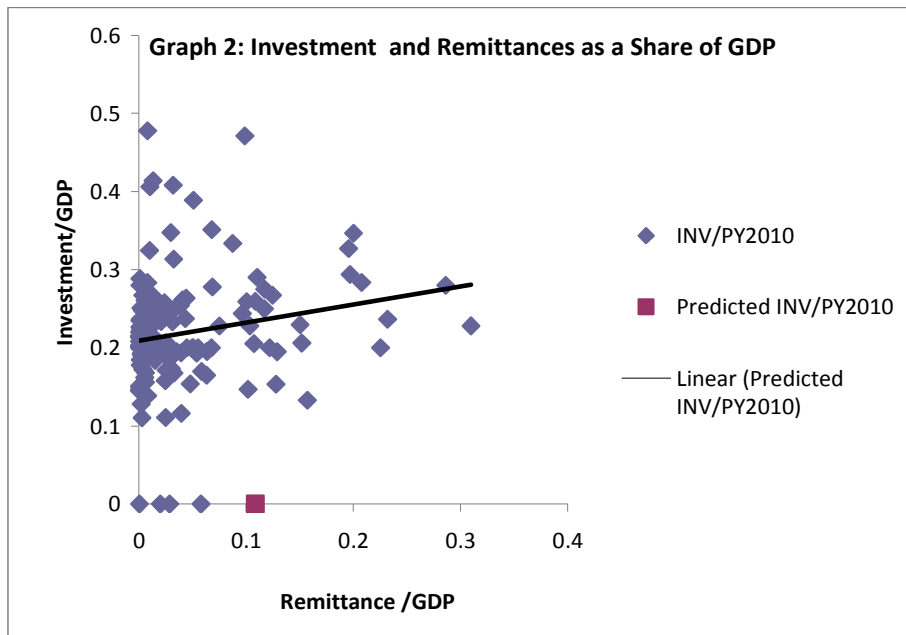
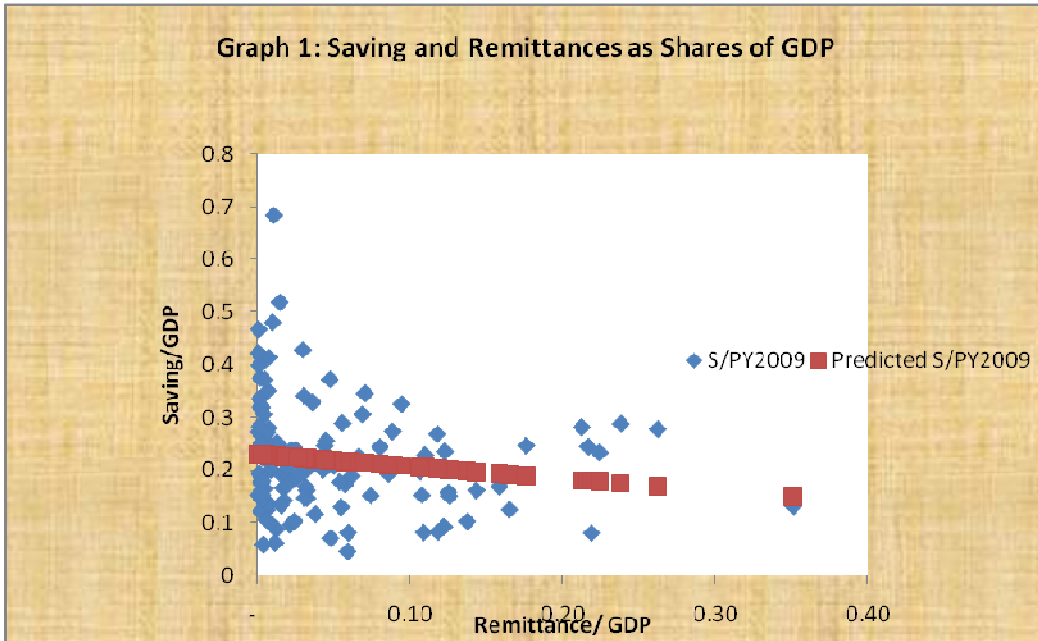
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Appendix 1

Country Name	Country Name	Country Name	Country Name
Albania	Germany	Morocco	Tonga
Algeria	Ghana	Mozambique	Trinidad and Tobago
Angola	Greece	Myanmar	Tunisia
Argentina	Grenada	Namibia	Turkey
Armenia	Guatemala	Nepal	Uganda
Australia	Guinea	Netherlands	Ukraine
Austria	Guinea-Bissau	New Zealand	United Kingdom
Azerbaijan	Guyana	Nicaragua	United States
Bangladesh	Haiti	Niger	Uruguay
Belarus	Honduras	Nigeria	Venezuela, RB
Belgium	Hong Kong , China	Norway	Vietnam
Belize	Hungary	Oman	Yemen, Rep.
Benin	Iceland	Pakistan	Zambia
Bhutan	India	Panama	
Bolivia	Indonesia	Papua New Guinea	
Bosnia & Herzegovina	Iran, Islamic Rep.	Paraguay	
Botswana	Iraq	Peru	
Brazil	Ireland	Philippines	
Bulgaria	Israel	Poland	
Burkina Faso	Italy	Portugal	
Burundi	Jamaica	Romania	
Cambodia	Japan	Russian Federation	
Cameroon	Jordan	Rwanda	
Cape Verde	Kazakhstan	Samoa	
Chile	Kenya	Sao Tome & Principe	
China	Korea, Dem. Rep.	Saudi Arabia	
Colombia	Kyrgyz Republic	Senegal	
Costa Rica	Lao PDR	Serbia	
Cote d'Ivoire	Latvia	Sierra Leone	
Croatia	Lebanon	Slovak Republic	
Cyprus	Lesotho	Slovenia	
Czech Republic	Liberia	Solomon Islands	
Denmark	Lithuania	South Africa	
Djibouti	Luxembourg	Spain	
Dominican Republic	Macedonia, FYR	Sri Lanka	
Ecuador	Malawi	Sudan	
Egypt, Arab Rep.	Malaysia	Suriname	
El Salvador	Maldives	Swaziland	
Estonia	Mali	Sweden	
Ethiopia	Malta	Switzerland	
Fiji	Mauritius	Syrian Arab Republic	
Finland	Mexico	Tajikistan	
France	Moldova	Tanzania	
Gambia, The	Mongolia	Thailand	
Georgia	Montenegro	Togo	

[Appendix 2:](#)



End Notes

ⁱ If saving is not responsive to interest rate changes (perfectly inelastic), this outcome implies that savings will not decrease and there is no remittance dependency.