

# Macroeconomic Determinants of Remittance Flows to Sub-Saharan Africa<sup>1</sup>

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# Macroeconomic Determinants of Remittance Flows to Sub-Saharan Africa

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## Abstract

The fundamental objective of this study is to empirically explore the macroeconomic factors that explain variations in migrant remittance inflows to Sub-Saharan Africa (SSA). In doing this, the paper sampled 38 out of 48 SSA countries for which consistent balanced panel data can be constructed for the period 2000-2009. The Blundell-Bond system GMM dynamic panel data analytical framework was adopted. The results show that migrant remittances are largely driven by altruism, a signal that the sub-region has not been able to attract more 'self-interest remittances', probably due to unattractive investment climate arising out of implementation of unsound macroeconomic policies. The key macroeconomic determinants of remittance flows, measured as a percentage of GDP, are home-country income, host-country income, income differential, inflation, real interest rate differential, real exchange rate depreciation, private sector credit, institutional quality and remittance inflows inertia. While remittance inertia, host-country income, income differential, inflation, institutional quality, interest rate differential and real exchange rate depreciation have consistent positive individual impacts on remittance inflows, home-country income and private sector credit have negative effects on remittances. This study, thus, recommends that to attract optimal remittances – remittances that are in excess of altruistic motive – to SSA, there is need to ensure macroeconomic stability and pro-growth policies, and strategic fiscal, monetary and exchange rate policy reforms in SSA.

# 1. Introduction

One of the consequences of globalization is increasing international migration, which has in turn resulted in increasing migrant remittances as an emerging alternative source of income in developing countries. Migrant remittances are typically made up of workers' remittances and compensation of employees. Workers' remittances are funds sent home by international migrants who have stayed abroad for at least 12 months while compensation of employees are part of the personal earnings of migrants who have stayed abroad for a period less than 12 months sent to their native countries. Even though a substantial amount of migrant remittances is sent through unofficial channels<sup>2</sup>, the amount of official remittances received by developing countries has been growing since the 1970s and has risen steadily during the last decade, in particular. In recent times, remittances have emerged as an important source of development finance and a mitigating factor for economic imbalances and financial instability particularly in under-developed economies. In some developing countries such as India, China, Mexico and other countries in South Asia and Latin America and the Caribbean, remittances have far exceeded international capital flows in the form of Official Development Assistance (ODA) and Foreign Direct Investment (FDI) in recent years. Accordingly, remittances have become a crucial source of foreign exchange in developing countries. Gross remittances received by developing countries reached US\$ 116 billion in 2003, representing more than 1.5% of their gross domestic product (GDP). In 2004, migrant remittances of US\$ 126 billion became the second most important source of foreign exchange earnings to developing countries. This was the year during which FDI to developing countries stood at US\$ 165 billion, with gross ODA amounting to US\$ 79 billion.

Arguably, since the last two decades, inward remittances have been the single-most significant factor that accounts for increased disposable incomes and substantial reduction of poverty in many developing countries. For instance, in Brazil, Mexico, Sri Lanka, Pakistan, India, Bangladesh, Cape Verde, Lesotho, Senegal, Sudan, Togo and Uganda, cross-border remittances have constituted a significant proportion of gross national income during the past decade. Also, Nigeria, a relatively large developing Sub-Saharan African country, takes an estimated average of 40% of the total transfers to Sub-Saharan Africa (SSA), and is the leading recipient of gross migrant remittances within the sub-region. It is also believed that the actual volume of migrant remittance flows to Nigeria exceed US\$ 1.3 billion per year. This estimate by the World Bank



(2006) makes remittances ranked as the second-leading foreign exchange earner for Nigeria since the mid-1990s. Also, for some relatively smaller SSA countries, workers' remittances account for a substantial proportion of their GDP. The World Bank (2006) observes that in 2005, Lesotho, for example, received around 35% of its GDP from migrant workers mainly resident in neighbouring South Africa. Similarly, in Eritrea, remittances accounted for about 194% of export earnings and 19% of GDP in 2005. During the last decade, remittances accounted for 80% of the current account deficit of Botswana.

Given the above, remittances can enhance the socio-economic prospects of developing countries. First and foremost, remittances can serve as a source of development finance through direct investment in the money and capital markets of beneficiary developing countries. Secondly, remittances to developing countries can raise the level of technological development, provided such remittances are in the form of direct investment into income-generating value-added projects. Thirdly, remittances may help improve consumer sovereignty by making the domestic markets more competitive through provision of a wide array of goods and services. Furthermore, when put into productive use, remittances, in a variety of ways, can help promote exports, and, therefore, improve upon the beneficiary country's Balance of Payments (BoP) position and international reserves. Indeed, in various macro-level studies, it has been shown that remittances promote human capital development (Adenutsi, 2010a; Adenutsi, 2010b), reduce absolute poverty (Adams and Page, 2005; Adams, 2006) and stimulate long-run growth in recipient countries (Faini, 2003; Mundaca, 2005; Ahortor and Adenutsi, 2009; Adenutsi, 2011). Meanwhile, the flow of remittances to SSA and other developing countries has become even more crucial in light of the unending difficulties in creating international reserves stemming from over-dependency on imports of high-value manufactured commodities and a narrowing weak export base of low-value primary commodities. The implication is that an understanding of the underlying factors of remittance inflows is imperatively essential for effective policy formulation towards rapid economic growth through foreign reserve sustainability and management.

Given the foregoing, development economists and policy experts in recent times, have developed keen interest in identifying the underlying forces or factors that pull migrant remittances to developing countries. This interest has arisen particularly because remittance inflows, observed to be a less volatile source of external funding than private capital and FDI, often vary counter-cyclically with variations in real income of remittance-recipient countries. Also, this interest in remittance flows to developing countries can be attributed to the fact that they do not require any servicing of future liabilities such as principal and interest or appropriation of dividends or profit transfers as is often the case with other private external capital.

Unfortunately, even though remittance flows to developing countries have more than doubled during the last decade, Africa experienced only a marginal rise in terms of absolute volume. For instance, gross remittances to Africa amounted to US\$ 9 billion (out of which SSA received US\$ 1.86 billion) in 1990 and by 2003, migrant remittance

flows to Africa had reached US\$ 14 billion (out of which SSA received US\$ 5.96 billion). During this period, Egypt and Morocco were the largest recipients of remittances in Africa with Northern Africa as a whole receiving over 60% of the total remittance flows to Africa (World Bank, 2006). Remittances sent to developing countries by their citizens working abroad have also witnessed a sharp rise since the 1990s. Here again, even though growth in migrant remittances has expanded generally across all the developing regions, SSA still lags behind as shown in Table 1 below.

Table 1: Migrant remittances received by developing economies, 1970-2009

Panel A: Gross Migrant Remittances Received, 1970-2009 (US\$'m)						
YEAR	EAP	ECA	LAC	MENA	SAS	SSA
1970	-	-	51.10	211.00	121.00	22.66
1975	29.32	1,312.00	198.87	965.68	438.45	363.11
1980	1,623.15	2,071.00	1,912.07	6,041.86	5,294.97	1,399.39
1985	2,065.68	1,714.00	2,610.26	6,139.84	5,802.18	1,173.64
1990	3,088.78	3,246.00	5,694.12	11,393.36	5,571.35	1,880.49
1995	8,924.76	6,481.51	13,322.00	13,275.09	10,005.02	3,193.16
2000	15,806.32	10,356.93	20,186.34	13,061.20	17,205.52	4,636.83
2001	20,998.21	10,301.62	24,445.53	15,322.75	19,172.37	4,655.20
2002	27,018.16	10,715.19	28,159.62	15,935.59	24,137.38	5,051.58
2003	32,279.41	11,597.11	36,767.94	20,460.67	30,365.65	5,963.72
2004	40,012.51	15,997.92	43,350.61	23,216.99	28,694.28	8,022.66
2005	50,299.57	23,261.98	50,144.46	25,078.39	33,924.41	9,417.81
2006	57,439.68	28,396.65	59,222.56	26,457.78	42,522.96	12,667.74
2007	71,073.13	39,332.26	63,281.48	32,144.80	54,040.59	18,583.95
2008	85,465.27	45,824.38	64,647.34	35,937.48	71,598.10	21,359.16
2009	84,957.29	35,420.57	56,905.81	33,526.81	74,850.31	20,823.82

Panel B: Total Migrant Remittances Received, 1970-2009 (US\$'m)	
EAP	590,501
ECA	324,962
LAC	594,632
MENA	454,871
SAS	562,522
SSA	159,150

Source: Authors' based on World Bank (2011), World Development Indicators

From Table 1, it is quite clear that although, generally, developing countries have been experiencing a consistent rise in inward flow of migrant remittances since the 1970s, SSA as a region has consistently been the least recipient in terms of absolute volume. Latin America and the Caribbean (LAC) region is the overall leading recipient of migrant remittances over the past four decades, having received a gross of US\$ 594,632 million. With a total of US\$ 590,501 million, East Asia and the Pacific (EAP) is the second-leading recipient; South Asia (SAS) received US\$ 562,522 million to be the third-leading recipient and with a total of US\$ 454,871 million. Middle East and North Africa (MENA) became the fourth-leading recipient. Europe and Central Asia (ECA) received a total of US\$ 324,962 million while SSA received a total of US\$ 159,150 million as the least recipient of migrant remittances over the period 1970-2009. Similarly, in per capita terms, SSA has consistently been the least recipient of migrant remittances over the past four decades while LAC, MENA and SAS have been the leading recipients (Figure A1). As a percentage of GDP, however, SSA has been the third-leading recipient of migrant remittances after MENA and SAS over the past four decades (Figure A2). These facts show that even though SSA is well-known as a leading exporter of both skilled and unskilled labour to the industrialized world<sup>3</sup>, the sub-region has not been able to harness the full potential of the benefits of labour exports by way of receiving official migrant remittances.

Certainly, several factors might have contributed to the failure of the sub-region to attract optimal remittances from its migrants. This study, therefore, explores the macroeconomic factors that militate against the optimal remittance inflows to SSA as a sub-region. This study is motivated by the fact that the macroeconomic environment plays a crucial role in attracting official remittances from international migrants.

## Research problem

Available data from the International Organization for Migration (IOM) and the United Nations (UN) suggest that as at the end of year 2000, more than 176 million people worldwide, implying one in every 35, were living outside their native countries. By the end of 2010, out of a stock of 214 million international migrants, which represents more than 3% of the world's population, 128 million persons, being 60.0% of global migrant stock, were residing in industrialized countries, of which 74 million, representing 57.8%, were nationals of developing countries. With the advent of globalization and increasing development gap between the industrialized and developing countries, the total number of migrants is set to increase at a higher pace.

Predictably, remittances have provided a platform for developing countries to consider ways of benefiting from their citizens who have chosen to live and work abroad, rather than merely over-emphasizing the negative implications of the seemingly irreversible South-North migration trend. Since the significant role of remittances in propelling the development agenda of Africa can no longer be ignored in any contemporary economic development model, there is need to offer incentives to attract such transfers into local savings and investment funds. The question that arises then is in what ways can developing countries maximize remittance inflows from the large pool of their nationals living and working abroad that could serve as a compensation for losing their skills and labour to the advanced countries? Since macroeconomic factors in the home country and the migrant-resident country could have implications for the regularity and volume of remittance inflows at the macro-level, it is imperative to investigate the macroeconomic factors that influence remittances to SSA.

Meanwhile, Freund and Spatafora (2005) identify SSA as the largest recipient of unofficial migrant remittances mainly because of the high cost of funds transfer as a consequence of under-development of its financial sector. This is particularly important because if the official remittances received by SSA, and the developing world as a whole, are low due to the fact that most of its migrants prefer patronizing unofficial channels to official channels in remitting, the implications for global security and sound macroeconomic management in these remittance-receiving countries can be varied and precarious. For instance, if a colossal amount of remittances is sent through unofficial channels, these funds could be used to support nefarious activities such as terrorism by Al Qaeda and anti-government pressure groups, ethnic conflicts, and underground economic activities including drug trade. Thus, the level of financial

sector development will have implications for official migrant remittance flows to SSA.

However, in the case of SSA, very little is known about the macroeconomic factors influencing remittance inflows. The only known study on the macroeconomic determinants of remittances in SSA as a sub-region is a publication by Singh et al. (2010) in which the authors failed to use a consistent measure of remittances across the 36 sampled countries<sup>4</sup>. Motivated by this research gap and the aforementioned reasons, this study seeks to identify the macroeconomic factors that affect the official flow of migrant remittances to SSA. The key research questions addressed in this study are: Do business cycle differentials explain remittance inflows? And to what extent does the macroeconomic environment of native and resident countries of migrants influence the inflows of remittances?

## Research objectives

In response to the above research questions, this study attempts to explain broadly the macroeconomic factors behind remittance flows to SSA. It seeks to find the long-run macroeconomic determinants of remittance flows to SSA. More specifically, with respect to SSA, the study seeks to determine the extent to which macroeconomic factors and business cycle differentials explain remittance inflows. From the empirical findings, the study prescribes macroeconomic policy guidelines for attracting optimal inflows of official migrant remittances to SSA.

## Organization of the study

The remaining part of this paper is structured as follows. Section 2 reviews the literature on the theories and determinants of remittance inflows. Section 3 presents some stylized facts on remittance flows to SSA. Section 4 provides the methodology and analytical framework of the study while Section 5 presents and discusses the empirical results. Section 6 summarizes and concludes the paper together with some policy recommendations.

## 2. Literature review

### Theoretical considerations and conceptual framework

#### Definition, motivations to remit and uses of remittances

Cross-border remittances are usually small-value non-debt-creating monetary transfers from income-earning migrants or benevolent organizations resident abroad sent to family members, other close associates, or non-governmental social welfare institutions resident in native or developing countries, directed at meeting a specific purpose. These flows are called migrant remittances if they strictly involve interpersonal transfers from an international migrant to his/her close relations resident in his/her native country. In other words, international migrant remittances exclude the transfer of funds from institutions to persons or social institutions in less privileged and vulnerable economic environments. This study is centred on migrant remittance flows as it directly relates emigration of labour, since labour is an important resource of which the SSA sub-region is well-known for its endowment and as a net exporter to the industrialized world.

From microeconomic viewpoint, the motivation for a migrant to remit part of his/her earnings to his/her native country is, either directly or indirectly, influenced by the end-use of remittances. For instance, to thoroughly understand the motives behind migrant remittance inflows and the magnitude, regularity and volatility of these flows to SSA, it is essential to be acquainted with how remittances are used within the sub-region. Although, admittedly the uses of remittances can only be studied appropriately and comprehensively at the micro-level (which is outside the scope of this study), a review of the available studies on the uses of remittances could offer some important insights into understanding the dynamics and trends in migrant remittance flows at the macro-level.

Rapoport and Docquier (2006) identify altruism, exchange, strategic behaviour, co-insurance, inheritance, investment and mixed factors as motives behind migrant remittance flows at the microeconomic level. This was after the debate on motivations to remit was triggered by Lucas and Stark (1985), who identified pure altruism, pure self-interest, and tempered altruism (or enlightened self-interest), as the microeconomic determinants of remittances using evidence from Botswana.

Altruistic motive of remittances is driven by the natural love and concern for improved living standards of the other family members and close associates left behind by migrant. In this case, the migrant derives positive utility from sending funds home to improve upon the socio-economic welfare of the beneficiaries (often close relatives and friends) in home countries, knowing very well that these recipients are in less advantageous economic environment that is plagued with poverty and other forms of economic vulnerability. It is expected that a rise in migrant remittances, negative economic shock in home country, decrease in disposable income of recipients and migrant intention to return to home country will positively impact on remittance flows driven by altruism, whereas the number of international migrants in target household reduces remittances over time.

Self-interest motive of remittances is driven essentially by the migrant's intent to return home after some time and hence the need to save at home in advance, and to earn respect among his/her family and close associates, and the aspiration to inherit a family property such as land, chieftaincy reign, and even sometimes to pull support for a political position. Regarding intention to return home in the future, the migrant can then use his/her family or any close associates as a trustworthy supervisor and well-informed agent who will monitor his/her own children and spouse left behind to undertake capital-intensive investment projects such as housing, commercial farming and other entrepreneurial initiatives. Cox and Stark (1994) note that in a three generational setting, a migrant may be motivated to remit his/her parents as a demonstration to his/her children how he/she (the migrant) should also be taken care of at old age by his/her children. For this demonstrative effect to be successful under this circumstance, the migrant makes sure the transfers of funds (i.e. remittances) are visible to his/her children and, even in some cases, to his/her grandchildren. The net earnings of the migrant and the intention to return home after some time rather than the negative economic shocks at home and the number of migrants in a household are expected to have a significant positive impact on remittances.

Tempered altruism (or enlightened self-interest) is the mixed motive of remittances representing the less extreme cases of pure altruism or self-interest. This motive of remittances is informed by an implicit contractual framework of mutual benefit from international migration, which involves that migrant and his/her family resident in his/her country of origin. The implicit contractual agreements would normally include co-insurance, loan repayment, exchange for services, and strategic behaviour. For instance, a household may agree to mobilize funds to finance the initial cost of of a family to a country where the probability of job acquisition and earning higher wages is relatively high. The migrant is expected to remit part of his/her income to the household left behind to off-set the debt acquired in sponsoring his/her trip, and thereafter remittances are expected to continue to flow especially during periods of negative economic shocks. A migrant could also enter into an agreement with his/her family to be sponsored abroad so that in return, he/she will pay the airfare of a certain number of economically active family members to travel abroad for greener pastures. Besides this, both parties (the migrant and the household) might agree to

invest the remittances received by the household in an agreed investment project that could be mutually beneficial to both parties. The investment project could serve as a hedge against uncertain future misfortunes such as ill-health and deportation of the migrant and negative shocks at home or in host country. Furthermore, in countries where extended family system and social ties are strong, migrants may be invariably compelled to remit home regularly as a compensation for the loss of his/her personal services to his/her family and community.

It should be obvious from the foregoing that the uses of international migrant remittances at the microeconomic level could be many and varying over time. It is very likely that in most average homes, from whichever motive driving migrant remittances, consumption and loan repayment towards improved living standards would lead the uses of migrant remittances at the initial stages. Over time, the use of remittances in a typical household is expected to switch in favour of investment in education and entrepreneurial ventures. As Gupta (2005: 4) puts it, evidence from different parts of the world shows that "remittances are mostly used for consumption and for investment in land and property". Connell (1980) and Ahlburg (1991) posit that remittances are used primarily for consumption rather than for financing investment projects because of the barriers and inconveniences attached to investment. The conclusions from studies conducted by Morauta (1985) and Boyd (1990) in Papua New Guinea, and Tongamoa (1987) for Tonga, support the view of Poirine (1997), and Brown and Poirine (2005) that most migrants are under social obligations to remit home for these remittances to be firstly used to resettle family debts incurred in financing their trips.

Of all the consumption purposes of using migrant remittances, clearly driven by altruism, available evidence shows that food and other general living expenses constitute the largest proportion. For example, cross-sectional studies conducted by Loomis (1990) in Cook Islands, Hayes (1993) in Papua New Guinea, Rensel (1993) in Fiji, Tongamoa (1987) in Tonga, Dennis (2003), Borovnik (2004) and Clark (2004) in Tuvalu and Kiribati, and Miotti et al. (2010) in Africa find that between 67% and 88% of remittances received are spent instantaneously on basic needs especially food items. These food items comprise imported tinned and processed foods, beverages, and tobacco (Tongamoa, 1987; Dennis, 2003). Other non-food consumables on which migrant remittances are spent in developing countries include healthcare services, clothes, telephones, household electronic appliances such as television set, sound and video systems, simple tools and equipment, housing and construction materials (Shankman, 1976; Loomis, 1990; James, 1991; Scott, 2003; Borovnik, 2004).

Investment in human capital and business ventures also benefit from migrant remittance usage. In Tuvalu and Kiribati, for instance, Borovnik (2003) and Clark (2004) find that education appears to be the second most important reason for remitting after food. The usage of remittances in human capital accumulation could take many forms viz. finance of schooling, vocation, and emigration. Brown (1995) finds that 75% of Samoan migrants and 33% of Tongan migrants have had their airfares paid by a migrant family member. Shankman (1976) finds that in Western Samoa, remittances were hardly used for capital investment projects because emigration was



regarded as a more lucrative investment than capital investment in businesses and other entrepreneurial initiatives. In contrast, Walker and Brown (1995) and Muliaina (2001) find that in Tonga and Samoa, a significant proportion of remittances is used for investment in farm inputs and simple tools and business establishments (see also Brown and Connell, 1993; Faeamani, 1995; Taylor, 1996). In a study on Mali in SSA, Findley and Sow (1998) also substantiated this finding by noting that remittances are not only used for consumption purposes but also for investment into mechanization in agriculture. Similarly, Gubert (2000) finds that remittance-receiving households in the Kayes Region of Mali do not only have higher income per capita, but these households use more mechanized farming techniques and sophisticated farm implements than their counterparts who have no family member resident abroad. Ahmed (2000) reveals that Somaliland remittance-receiving households use these transfers mainly for financing productive activities even in periods of harsh economic and political conditions.

If remittances are meant for small and medium-scale capital investment projects, they are likely to be initially saved until the target working capital is obtained. James (1991) and Borovnik (2003) find that young families in Tonga save a portion of remittances received towards future use. McCormick and Wahba (2001) find that literate returnees to Egypt have a higher probability of using their savings from abroad to become entrepreneurs, while longer stay abroad has no influence on a returnee migrant becoming an entrepreneur. Miotti et al. (2010) find that the general motivation to remit for investment purposes other than owning a house in a native country is a major concern for uneducated migrants and those who stayed in France the longest. In contrast, migrants from SSA "send money for current expenditures rather than for investment" (Miotti et al., 2010: 17).

International migrants also remit to native communities and religious bodies and leaders as found by Shankman (1976), Brown (1995) and Scott (2003), while Walker and Brown (1995) find that remittance-recipient households sometimes spend these funds (often only in excess of consumption) on payment of marriage expenses, funerals and other social, cultural and religious ceremonies. For SSA, Diatta and Mbow (1999) discovered that besides consumption, remittances were used to finance development projects in migrant's home communities in Senegal. Gubert (2002) finds that the household members who fell ill during the year are the most significant reason why Malian migrants remit, and these remittances increase once a family member dies. Averagely, one death and one sick family member induce an increase in migrant remittances by 124%.

Given the above scenarios, there are no clear-cut uses of migrant remittances across recipient families in the developing world, implying there is no universal answer to the question as to whether remittances are spent on 'productive' or 'unproductive' activities. However, since consumption remains the most important use of remittances in many remittance-receiving homes, as evidence shows, the microeconomic impact of remittances on welfare is obviously positive as far as household access to basic essential needs of life is concerned. At the macroeconomic level, however,



the uses of remittances, whether for altruistic or investment (self-interest), may be dependent upon the nature of business cycle of the recipient country. For example, during recession, migrant remittances received are likely to be used for consumption purposes, while they are more likely to be used for investment purposes when the recipient economy is booming.

## Theory and empirics of macroeconomic determinants of remittances

### Macroeconomic theory of remittances

From the perspective of altruism at the macro-level, remittances are higher when negative shocks associated with higher rates of under-employment and unemployment occur in migrant's native country as the desperate macroeconomic conditions compel active labour to travel outside in search for greener pastures. In this context of pure altruism, higher growth in real GDP, lower rate of inflation, limited access to private sector credit and exchange instability in the home countries adversely affect remittance inflows (Swamy, 1981; Brown, 1997; Vargas-Silva and Huang, 2006). In addition, it is conceivable that the distance between migrant native country and the more advanced country of residence has an inverse effect on both migration and remittances as the cost of migration might restrict the number of active potential migrants and socio-economic ties with relations at home.

In contrast, the portfolio choice theory suggests a direct relationship between remittances and GDP growth, as higher growth implies improved economic conditions and bigger potential market which are required for increased investment, whereas the relationship between remittance inflows and macroeconomic and political instability is negative since investment opportunities may be limited. It is also asserted that implementation of restrictive macroeconomic policies such as exchange rate restrictions does not attract higher remittances. On the other hand, a liberalized financial sector and improved financial development attract higher remittances (Russell, 1986; World Bank, 2006).

Thus, although, theoretically, remittances can be analyzed from two different perspectives (the altruistic and portfolio viewpoints), at the macro-level, available literature has shown that many empirical studies often combine the two approaches when analyzing remittances.

### Empirical evidence on macroeconomic determinants of remittances

Since Lucas and Stark (1985) initiated the debate on the determinants of remittances, the motivation for providing empirical evidence has remained unending. Though the motives behind remitting might differ across time, households and countries, generally it is believed that growth in migrant income and negative shocks at home

countries have a direct relationship with remittances. For instance, with respect to home-country's economic performance, many studies including El-Sakka and McNabb (1999), De la Brière et al. (2002), Bouhga-Hagbe (2006), Yang and Choi (2007), Niimi and Özden (2008) and Singh et al. (2010) provide evidence on countercyclical property of remittances. In sharp contrast, Higgins et al. (2004), Aydaş et al. (2004) and Freund and Spatafora (2005) conclude that remittances exhibit a procyclical behaviour as they tend to rise with improvements in GDP per capita and the growth rate of remittance-receiving countries. Sayan (2006) also finds that, in most cases, remittances tend to be either acyclical or procyclical.

Empirical literature suggests that the number of migrant workers outside home country<sup>5</sup>, differences in wage rates at home and abroad, economic condition at native country, exchange rates, interest rate disparity between home and resident country, political risk, facilities or mechanisms of international money transfer and the economic conditions in the country of residence may influence remittance flows. As observed by the IMF (2005), the level of economic activities in the migrant's resident country is important because improved economic conditions in the host country strengthen the ability of migrants to increase their employment and earnings' prospects, which puts them in a better position to remit more money home. Similarly, during periods of recessions at home, migrants may be compelled to increase remittances in a bid to mitigate the adverse effects of the negative economic shocks at home. Jadhav (2003) analyses the determinants of workers' remittances to India using a log-linear regression specification involving oil prices, US GDP, interest rate differential measured as the difference between nominal domestic interest rate and LIBOR, and exchange rate depreciation as explanatory variables. The empirical results show that oil prices and exchange rate depreciation positively impact on remittance flows to India. In a similar fashion, Gupta (2005) in an attempt to analyse a more complete model to unearth the determinants of remittance flows to India by including a trend, number of migrants, changes in country rating, and return on domestic stock market finds that, in India, the main determinants of remittances are migration, gross migrant earnings, and economic environment in migrant resident country. The Indian drought dummy variable has been found to have a positive impact on cyclical component of remittances. In this study, Gupta (2005) fails to find political uncertainty, interest rates, and exchange rate depreciation to have significantly affected remittance flows to India.

El-Sakka and McNabb (1999), in an attempt to explain nominal remittances received by Egypt, included real income levels of the sending and receiving countries, interest rate differentials, rate of inflation in Egypt, and the black-market premium for foreign exchange as regressors in a single equation following the Ordinary Least Squares procedure. The empirical results show that whereas remittances increase with Egyptian rate of inflation and income abroad, they decline with the black-market premium. Bouhga-Hagbe (2004) analyses workers' remittance flows to Morocco within the context of vector-error correction (VEC) model. The results suggest that, over the long-run, remittance inflows are positively correlated with wage levels in the source country proxied by wage levels in France, while they are negatively correlated with

real GDP growth in Morocco. Likewise, Lueth and Ruiz-Arranz (2007) estimate a VEC model for Sri Lanka using quarterly macroeconomic data, namely real GDP, consumer price index, exchange rate, interest rate, and oil price from 1996 to 2006 and found that remittances are positively correlated with oil price, but behave strongly procyclically, and decline with the depreciation of the Sri Lankan currency. In this regard, Lueth and Ruiz-Arranz (2007) conclude that remittances to Sri Lanka appear to be less of a hedge against macroeconomic shock than widely conceived.

Swamy (1981) and Adams and Page (2005) prove a significant relationship between remittance inflows and the number of migrants abroad and the distance between the source country and the remittance-receiving country. In particular, Adams and Page (2005) discover that the distance between the host and the home countries of migrants has a negative impact on both migration and remittances, because long distances make it expensive and unattractive to maintain strong economic and social ties. Also, the personal characteristics of a migrant, especially the level of education which directly impacts on migrant earnings, determines the volume of remittances. Meanwhile, conclusions from various empirical studies including Freund and Spatafora (2005), Adenutsi (2011) and Adenutsi et al. (2011) conclude from various empirical studies that, overall, financial markets and institutions contribute positively to the determination of remittance inflows through official channels.

Russell (1986) and Chipeta and Kachaka (2005) find that the decision to remit depends on different factors over the business cycle rather than the altruistic motive of smoothing consumption of recipients. Vargas-Silva and Huang (2006) later provided a theoretical framework that incorporated this conception. In an empirical study on Malawi, Chipeta and Kachaka (2005) find that the flow of remittances across international borders depends on interest rate differentials of the home country and the main host country of migrants, the rate of inflation, the level of economic activity in the host country, and the exchange rate in the home country. Moore and Greenidge (2008) find a similar evidence for 15 Caribbean countries. In the case of Ghana, Adenutsi and Ahoritor (2008) find that, in static and dynamic terms, monetary aggregates and policy interest rate positively impact on remittance inflows, while increases in domestic price level inhibit the inflow of remittances. Exchange rate is a positive determinant of remittances in a static model but its impact is negative in a dynamic setting (Adenutsi and Ahoritor, 2008).

In a study involving a panel of 36 SSA countries, Singh et al. (2010) find for the period 1990-2005 that stock of migrants residing in wealthier countries, institutional quality of native country, and host-country income positively impact on remittances received by SSA, while home-country income, real exchange rate appreciation and interest rate differential impede remittance inflows to the sub-region.

In a most comprehensive study on SSA, Adenutsi et al. (2011) conclude from a panel of 36 SSA countries over the period 1980-2009 that both for a decade-by-decade analysis and for an overall-period analysis, home-country income, host-country income, rate of inflation, real exchange rate, bank credit to private sector, real deposit interest rate, institutional quality and a dummy for post-September 11, 2001

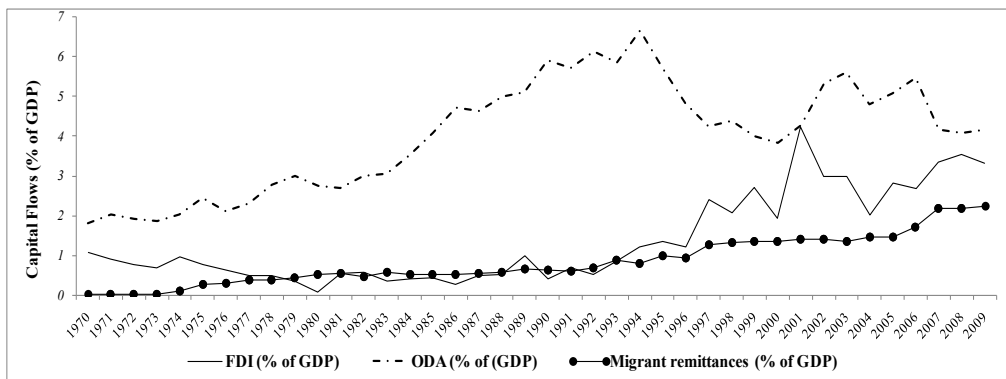
explained significant proportions of the total variations in remittances received in SSA. Furthermore, the current level of migrant remittances received in SSA is determined by the amount of remittances received over the past two years, with the asynchronous effects generally positive at lag one but negative at lag two. More specifically, besides the asynchronous effects, and the positive impact of host-country income (or migrant income) and real deposit interest rate, all other explanatory variables viz. institutional quality, host-country income (or family income), rate of inflation, bank credit to private sector, and real exchange rate had a negative impact on migrant remittances received in SSA during the decade 2000-2009. The results for the overall period (1980-2009) analysis remain virtually the same except that home-country income and bank credit to private sector just as dummy for post-September 11, 2001 had positive effects on migrant remittance flows to SSA while the impact of real deposit interest rate was statistically zero.

In summary, empirical results from various macroeconomic studies on remittance inflows reveal that remittances are: (i) countercyclical in so far as they increase during economic downturns in recipient countries; (ii) driven more by an altruistic motive than by an investment motive; (iii) stimulated by life-sustaining motives for which reason they are more for transactions motive (consumption) than for investment motive; and (iv) are relatively insensitive to interest rate differentials between home and abroad. Other macro-variables that have been of empirical relevance to remittance flows to developing countries include rate of inflation as a measure of financial instability in the home country, return in the stock market or return on property which is one of the measures of degree of financial sector development, black market premium, exchange rates, fiscal policies, and default risk which is often proxied by domestic political uncertainty, geopolitical conditions, or rating downgrades by established credit rating institutions.

### 3. Remittance flows to Sub-Saharan Africa: Some stylized facts

From the 1990s, migrant remittance flows to SSA have steadily been growing slowly but remained the least non-debt source of external capital to the sub-region (Figure 1). Between 1978 and 1992, migrant remittances received by SSA were the second-leading source of external capital inflows (only after ODA) notwithstanding the stagnating growth. Since 1993, however, FDI to the sub-region surpassed the migrant remittances and this trend has been persistent throughout the 2000s.

Figure 1: External capital flows to SSA, 1970-2009



Source: Authors compilation based on World Bank (2011), World Development Indicators

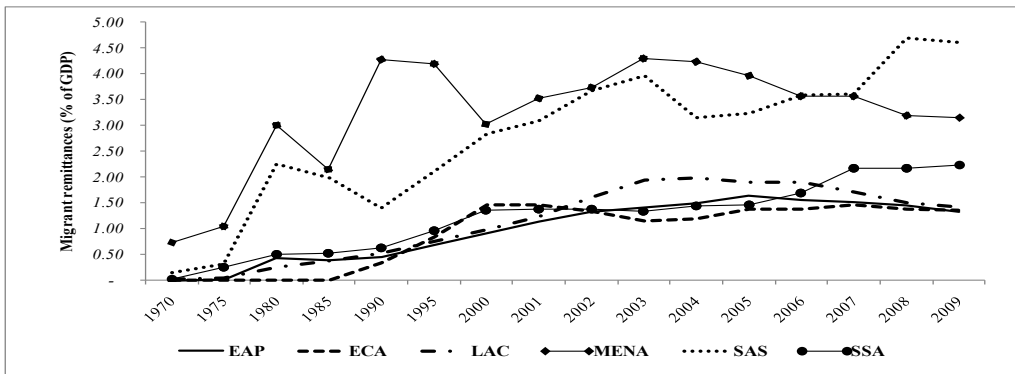
Figure 1 also shows that since 1970, SSA remained aid-dependent. On average, ODA, migrant remittances and FDI inflows have been rising over the past four decades but ODA has been on the descent since the mid-1990s. Perhaps the two most important stylized facts that have been revealed in Figure 1 are that: (i) migrant remittances are the least volatile external resource to SSA; and (ii) there appears to be a similarity in the growth trends in migrant remittances and FDI flows to SSA.

The growth trend similarities in migrant remittances received and FDI inflows could imply that even if remittances are driven by altruism, there are likely to be some common macroeconomic factors that influence the volume of both FDI and remittance inflows to SSA. For instance, macroeconomic performance as related to good investment climate, political stability and financial sector development that often positively impact on the inflows of FDI are likely to equally directly influence the

official inflow of migrant remittances in SSA during the period under consideration.

From Figure 2, it can be concluded that SSA is the third-highest recipient of migrant remittances when measured as a percentage of GDP. MENA and SAS lead as the first and second-largest recipients. The third position occupied by SSA has not been consistent over the past four decades under consideration. For example, from the late 1990s to 2002, SSA dropped from the third spot to the fourth, and further then from the fourth position to the fifth position between 2003 and 2005. From the year 2007, however, SSA maintained the position of the third-largest recipient of migrant remittances in the world.

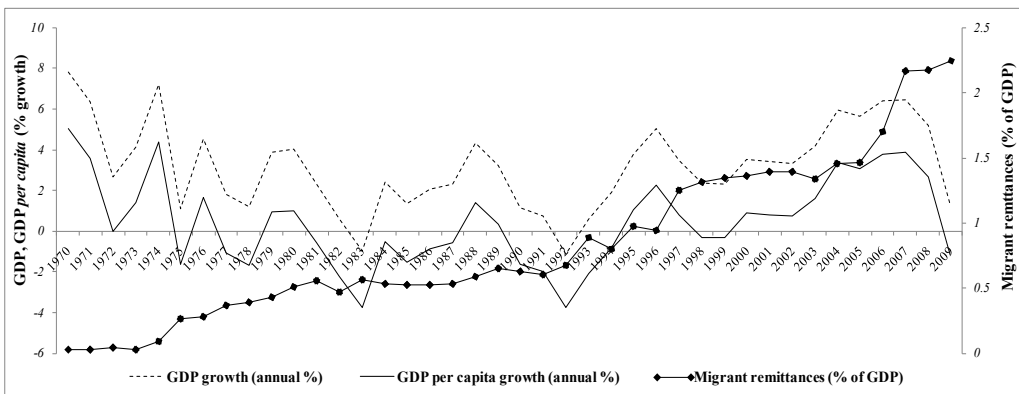
Figure 2: Trends in global migrant remittance inflows, 1970-2009



Source: Authors compilation based on World Bank (2011), World Development Indicators

One implication for this inconsistency and the fact that the SSA has never led as a largest recipient of remittances, despite that it is well-known for its low output level and high episode of brain drain, is that the sub-region might be lacking the appropriate policy framework to attract optimal remittances from its nationals working abroad.

Figure 3: Cyclicity in migrant remittance flows to SSA, 1970-2009



Source: Authors compilation based on World Bank (2011), World Development Indicators

On the cyclicity in the flow of migrant remittances received by SSA, Figure 3 shows that remittance inflow was acyclical in the 1970s, and became countercyclical throughout the 1980s. From the 1990s, it appears as though migrant remittance inflows are pro-cyclical relative to growth in GDP, albeit the newly emerging countercyclicity from the year 2007.

The facts as presented in Table 2 show that the popularly held view that migrant remittances flow to poorest countries does not generally apply to countries in SSA.

Table 2: Migrant remittance-dependent economies in SSA, 2000-2009

A: Top-10 Remittance Per Capita Dependents		B: Top-10 Dependent Countries (as % of GDP)		C: Top-10 Dependent Countries (in US\$m)	
Rank	Country (remittances <i>per capita</i> in US\$)	Rank	Country (% share of GDP)	Rank	Country (remittances in US\$ millions)
1	Cape Verde (249.88)	1	Lesotho (27.66)	1	Nigeria (4,465.23)
2	Mauritius (170.62)	2	Cape Verde (12.69)	2	Sudan (1,510.82)
3	Lesotho (168.66)	3	Gambia, The (9.16)	3	Kenya (957.81)
4	Seychelles (89.09)	4	Liberia (8.87)	4	Senegal (749.59)
5	Swaziland (71.37)	5	Togo (8.60)	5	South Africa (583.74)
6	Senegal (64.91)	6	Senegal (8.20)	6	Uganda (422.05)
7	Botswana (42.74)	7	Guinea-Bissau (7.56)	7	Lesotho (336.75)
8	Sudan (38.31)	8	Sudan (5.23)	8	Mali (219.65)
9	Togo (31.15)	9	Uganda (4.60)	9	Mauritius (210.82)
10	Nigeria (30.56)	10	Kenya (4.55)	10	Togo (190.92)
<hr/>					
A: Bottom-10 Remittance Per Capita Dependents		B: Bottom-10 Dependent Countries (as % of GDP)		C: Bottom-10 Dependent Countries (in US\$m)	
Rank	Country (remittances <i>per capita</i> in US\$)	Rank	Country (% share of GDP)	Rank	Country (remittances in US\$ millions)
1	Ghana (3.76)	1	Cameroon (0.54)	1	Madagascar (13.41)
2	Congo, Rep. (3.53)	2	South Africa (0.27)	2	Namibia (13.24)
3	Mozambique (3.44)	3	Madagascar (0.26)	3	Comoros (12.00)
4	Rwanda (3.11)	4	Congo, Rep. (0.23)	4	Congo, Rep. (11.98)
5	Ethiopia (2.16)	5	Namibia (0.22)	5	Gabon (8.21)
6	Madagascar (0.78)	6	Mauritania (0.12)	6	Seychelles (7.54)
7	Mauritania (0.68)	7	Burundi (0.11)	7	Mauritania (2.00)
8	Tanzania (0.37)	8	Tanzania (0.11)	8	Sao Tome & Principe (1.48)
9	Burundi (0.16)	9	Gabon (0.10)	9	Burundi (1.29)
10	Malawi (0.07)	10	Malawi (0.03)	10	Malawi (0.93)

Source: Authors compilation based on World Bank (2011), World Development Indicators. Note: Values based on years for which data are available: Burundi (2004-9).

For example, with the exception of Seychelles, Gabon, Congo Republic, Mauritania and Namibia, which are ranked among the top-20 countries with the highest real per capita gross national income (GNI) at purchasing power parity (PPP) (see Table A1 in the Appendix), most of the top-20 countries with the highest real GNI per capita PPP within the sub-region viz. Mauritius, South Africa, Cape Verde, Senegal, Lesotho, Sudan, Nigeria and Kenya are also countries that dominate as leading remittance-recipients, both in absolute and relative terms. Similarly, based on the average real GNI per capita PPP between 2000 and 2009, the poorest-20 countries within the sub-region (including Burundi, Malawi, Ethiopia, Rwanda, and Madagascar) dominate the list of countries with the least receipt of remittances in both absolute and relative terms. Over the 2000-2009 period, Seychelles emerged as the fourth highest recipient of migrant remittances per capita in SSA probably due to its small population size. The relative large GDP of South Africa (the fifth largest recipient in absolute terms) could

be the explanation for its ranking among the bottom-10 remittance recipients in terms of remittance-GDP ratio.

Except for Senegal, the top-5 leading recipients of migrant remittances (in absolute terms) within the sub-region, notably Nigeria, Sudan, Kenya, and South Africa are the countries that have the highest population, and therefore are most likely to have the highest number of emigrants. Similarly, countries such as Cape Verde, Mauritius, Lesotho, Seychelles, Swaziland, Senegal and Togo with small geographical size and population dominate the list of highest remittance recipients in per capita terms but the list of top-10 remittance per capita recipients also has Sudan and Nigeria with relatively large population and geographical sizes.

Another striking revelation is that South Africa, the only SSA country described as having an emerging financial market by the IMF, is among the leading recipients of migrant remittances when measured in actual volumes. Furthermore, Kenya, Mauritius, Nigeria and Uganda, which are listed among the top-10 recipients of migrant remittances in actual volumes, are also countries that have frontier financial markets, according to IMF classification. However, Seychelles and Namibia are countries with a frontier financial market but ranked among the bottom-10 recipients of migrant remittances within the sub-region. It is thus expected that financial market development should be a positive determinant in attracting official remittances. This does not necessarily imply that financial development should automatically lead to higher inflows of migrant remittances because it depends on the dominant motivation and uses of remittances. For instance, if the flow of migrant remittances is dominated by altruism, then as financial systems of the recipient countries develop and private sector access to credit improves, 'altruistic remittances' are expected to fall or increase at a decreasing rate, while 'self-interest remittances' are expected to rise or increase at a non-decreasing rate<sup>6</sup>. As to whether a country depends on migrant remittances when measured per population (or GDP) largely depends on the size of the population (or GDP) of that country. For example, although Nigeria is the largest recipient of migrant remittances in terms of actual volumes (receiving 40% of the total flows to SSA) and ranked among the top-10 largest remittance-recipients in per capita terms, the Nigerian economy is not remittance-dependent when measured as a ratio of GDP due to its large GDP<sup>7</sup>.



## 4. Methodology and analytical framework

From the literature reviewed, a number of macroeconomic variables are essential in formulating the empirical model. These are lagged remittances received, real bilateral exchange rate depreciation, home-country income, host-country income, private sector credit, institutional quality, inflation rate in the home country, and real deposit interest rate differential between the home country and the host country. These variables have been the most consistently used in empirical studies at the macroeconomic level (Jadhav, 2003; Bouhga-Hagbe, 2004; Freund and Spatafora, 2005; Aydaş, 2004; Gupta, 2005; Lueth and Ruiz-Arranz, 2007; Singh et al., 2010). Apart from this, the inclusion of these variables is in line with the theoretical framework built by Vargas-Silva and Huang (2006) following the pioneer work of Lucas and Stark (1985). The analytical framework of this study is rooted on an expanded version of Vargas-Silva and Huang (2006)<sup>8</sup>.

With the above set of explanatory variables, a system dynamic panel-data model is formulated in line with Blundell and Bond (1998) methodological approach. The general model is specified for 38 SSA countries as follows:

$$\mathfrak{R}_{i,t} = \alpha_0 + \sum_{\rho=1}^n \alpha_{\rho} \mathfrak{R}_{i,t-\rho} + \alpha_{n+1} Y_{i,t}^h + \alpha_{n+2} Y_{i,t}^f + \alpha_{n+3} PSC_{i,t} + \alpha_{n+4} NSQ_{i,t} + \alpha_{n+5} INF_{i,t} + \alpha_{n+6} RXR_{i,t} + \alpha_{n+7} IRD_{i,t} + \varepsilon_{i,t} \quad (1)$$

where the dependent variable, migrant remittances as a percentage of GDP is denoted by ( $\mathfrak{R}$ ) for the  $i^{\text{th}}$  native country at time  $t$ .  $Y_{i,t}^h$  is home-country income measured as annual growth in real per capita income of the native country  $i$  at time  $t$ ;  $Y_{i,t}^f$  is host-country income measured as annual growth in real per capita income of the host country  $i$  at time  $t$ ; and  $PSC_{i,t}$  is bank credit to the private sector as a ratio of GDP in the native SSA country  $i$  at time  $t$ .  $NSQ_{i,t}$  is institutional quality of the native SSA country  $i$  at time  $t$ .  $INF_{i,t}$  indicates the rate of inflation measured as annual growth in consumer price index for native country  $i$  at time  $t$ .  $RXR_{i,t}$  indicates real bilateral exchange rate of the currency of native country  $i$  against the US dollar at time  $t$  after adjustment of the misalignment to the year 2000 as a base year.  $IRD_{i,t}$  is real interest rate differential for the  $i^{\text{th}}$  country relative to host country (the United States) real interest rate at time  $t$ . The residuals ( $\varepsilon_{i,t}$ ) are white noise such that  $\varepsilon_{i,t} \sim N(0, \sigma^2)$  and  $t = (1, 2, \dots, T)$ .

To verify if business cycle differentials (i.e. the effects of the differences in host-country income and home-country income rather than the split-effects of these two incomes) that determine the flow of remittances from the migrant-host country to the migrant-home country, empirical model II (specified as Equation 2 below) is estimated using the income differential between the migrant and his/her family. The estimation of Equation (2) also enables us to check the robustness of our empirical model I and compare our results with other similar previous studies that used this measure.

$$\mathfrak{R}_{i,t} = \alpha_0 + \sum_{\rho=1}^n \alpha_{\rho} \mathfrak{R}_{i,t-\rho} + \alpha_{n+1} YDF_{i,t} + \alpha_{n+2} PSC_{i,t} + \alpha_{n+3} NSQ_{i,t} + \alpha_{n+4} INF_{i,t} + \alpha_{n+5} RXR_{i,t} + \alpha_{n+6} IRD_{i,t} + \varepsilon_{i,t} \quad (2)$$

where YDF denotes income differential, computed as  $Y^f$  minus  $Y^h$ , with all other variables and notations defined as in (1) above. Equations (1 and 2) imply the estimation of two sets of two specific dynamic panel-data models with the same explanatory variables except YDF, which replaces the separate effects of home-country income and host-country income in Equation (1). A pair of fixed-effects panel-data model consistent with empirical Equations 1 and 2 is also estimated in a bid to test for the robustness of the dynamic analytical framework.

A priori, it is expected that the estimated coefficients of lagged remittances ( $\mathfrak{R}_{t-\rho}$ ),  $Y^f$  and NSQ would be significant and positive, but that of  $Y^h$  is expected to be just as YDF, PSC, RXR, INF, and IRD is expected to be indeterminate depending upon which of the underlying motives of remittance inflows dominates.

The choice of the dynamic GMM panel data model is informed by the fact that data on remittance flows in most SSA countries are very scanty, such that the panel has small 'T' and large 'N'. It is also guided by facts that the relationship under consideration is linear; the left-hand side variable is singular and dynamic; the explanatory variables are not strictly exogenous; there are fixed individual effects; and there are heteroskedasticity and autocorrelation within the cross-sectional units but not across them (Roodman, 2006). The selection of 38 SSA countries is also based on consistent country-specific data availability for a minimum of six recent years during the period, 2000-2009.

The study employed Blundell-Bond 'system' GMM estimation technique. This is preferred to 'difference' GMM following Arellano-Bond (1991) and 'deviation' GMM after Arellano and Bover (1995) since in 'system' GMM it is possible to include time-invariant regressors which tend to disappear in 'difference' GMM (Roodman, 2006). Additionally, the 'system' GMM allows for more instruments and, thus, makes the coefficient estimates more efficient and consistent. To test for the joint validity of instruments used, the Sargan-Hansen test for over-identifying restrictions was performed after the GMM estimation as recommended by Bond (2002) and Roodman (2006). Besides,

Arellano-Bond test was performed to detect autocorrelation in the idiosyncratic disturbance term, a situation that rendered some lags invalid as instruments.

## Data measurement, sources and expected impact on remittances

This study makes use of secondary data. The relevant series are collated in a low frequency form for the period 2000-2009. The key variable of focus and whose measurement posed the greatest challenge is remittance flows. For this study, remittances are defined as the sum of two components, namely workers' remittances recorded in the current account of the balance of payments (BoP) under the heading "current transfers"; and compensation of employees recorded under the "income" sub-category of the current account. Unlike in the recent work on SSA by Singh et al. (2010) and as in many studies on remittances, in this study, migrant transfers are not included in the measurement of migrant remittances. This is essentially because migrant transfers, defined as the net claims of migrants on their respective countries of employment to another country, often their home countries, is different from the other two in three main ways: (i) it is recognized as a capital transfer and therefore recorded under the capital account sub-category called 'capital transfers'; (ii) it is received by the migrants themselves rather than their dependants or non-migrants; and (iii) it is not regular in flow or a 'recurrent remittance' as a migrant can only earn this when he/she has changed his/her country of employment. Both of workers' remittances and compensation of employees were obtained from the World Development Indicators (WDI) published by the World Bank based on the Balance of Payments Statistics Yearbook (BoPS) of the International Monetary Fund (IMF). The April 2011 Editions of WDI and GDF CD-ROM were used.

The rest of the relevant macroeconomic variables were obtained essentially from IMF's World Economic Outlook (WEO) and International Financial Statistics (IFS) Yearbook / CD-ROM and the World Bank's World Development Indicators (WDI). In Table A2 in the Appendix, the detailed description, measurement and sources of the explanatory variables under consideration for inclusion in the empirical model are outlined. The list of the 38 SSA countries used in the modelling is provided in Table A3 in the Appendix.

## 5. Empirical results and discussions

The estimation results for the system dynamic panel models are presented in Table 3.

Table 3: Estimated results of empirical models

System dynamic panel-data estimation			Number of observations = 297	
Group variable: ccode			Number of groups = 38	
Time variable: year			Obs per group:	min = 4.0
				avg. = 7.8
				max = 8.0
Two-Step Results by Blundell-Bond System GMM Estimation Procedure				
Dependent Variable ( $\mathfrak{R}$ )	Model I		Model II	
Explanatory Variable	coefficient	z-statistic	coefficient	z-statistic
$\mathfrak{R}_{t-1}$	0.66405	(169.85)***	0.66591	(164.99)***
$\mathfrak{R}_{t-2}$	0.08820	(59.85)***	0.08651	(46.97)***
Income differential (YDF)	.....	.....	1.02048	(16.96)***
Home-country income ( $Y^h$ )	-0.98615	(-12.80)***	.....	.....
Host-country income ( $Y^f$ )	3.91536	(16.50)***	.....	.....
Bank credit to private sector (PSC)	-0.02731	(-12.92)***	-0.02483	(-22.12)***
Institutional quality (NSQ)	0.07705	(10.03)***	0.08422	(10.88)***
Rate of inflation (INF)	0.02085	(10.80)***	0.02018	(15.20)***
Interest rate differential (IRD)	0.00957	(4.20)***	-0.00000	(-0.00)
Real exchange rate depreciation (RXR)	1.35704	(36.62)***	1.25974	(46.56)***
Constant term (Constant)	-33.3654	(-14.68)***	-2.28660	(-9.13)***

continued next page

Table 3 Continued

Number of instruments:	51	50
Wald :	1,200,000{0.000}***	1,420,000{0.000}***
Instruments for differenced equation: GMM-type: L(2/.) ( $\mathfrak{R}$ )		
Standard: (D.YDF) (D.Y <sup>h</sup> D.Y <sup>f</sup> ) D.PSC D.NSQ D.INF D.IRD D.RXR		
Instruments for level equation: GMM-type: LD ( $\mathfrak{R}$ )		
Standard: _constant		
Arellano-Bond test for zero autocorrelation in first-differenced errors: H0: no autocorrelation		
Order 2:	-1.3340{0.1820}	-1.3250{0.1852}
Sargan-Hansen test of over-identifying restrictions: H0: over-identifying restrictions are valid		
	=26.8161{0.9572}	=30.8620{0.8755}

Source: Authors' estimation; Note: \*\*\* indicates significance at 1%

For the estimated results, the system dynamic panel has 38 countries with 297 observations and 51 instruments (in the case of Model I) and 50 instruments (in the case of Model II). The system panel data are strongly balanced with the minimum, mean and maximum number of observations per group of the estimated models being 4, 7.8 and 8, respectively. With a probability of 0.00 in each case, the Wald statistic of the estimated models suggests that the right-hand side variables jointly explained the total variations in migrant remittances at 1% level of statistical significance over the study period. The Arellano-Bond test statistics for each of the estimated models attest to the fact that, at 1% level of statistical significance, there are no second-order autocorrelations in the residuals generated from the 2-step estimation procedure. Similarly, the statistic produced by the Sargan-Hansen test for over-identifying restrictions failed to point to the fact that the instrumental variables used are not valid statistically. Based on these diagnostic tests, we conclude that for each of the estimated system dynamic panel-data models in Table 3, the estimators are statistically efficient, unbiased and reliable. The results of the fixed-effects estimation, for the purposes of verifying the robustness of the system dynamic panel-data estimation, are reported in Table A4 in the Appendix. The estimated results show that the system dynamic approach is more efficient and appropriate in the context of this analysis.

Our estimated results show that there is a historical trend in migrant remittance flows to SSA in view of the significant positive impact of the first- and second-lagged values of the dependent variables in both empirical models. In both models, remittances over the past two-years account for 75% partial variations in current remittances. This implies that the amount of remittances sent by a migrant at any time is positively driven by how much was remitted in the last two years. Indeed, the declining trend in the magnitude of the estimated coefficient of the immediate past values of remittances received shows that, over time, the influence of past remittances in determining current remittances

reduces and does not actually go beyond the second year in any of the estimated model. This result supports the view that altruistic motive of remittances holds for SSA, but this prevails in the initial years (the first-two years) only, and further explains why migrant remittances are relatively the most stable and resilient form of external capital for financing development projects in developing countries.

From the empirical results of Model I reported in Table 3, with an estimated coefficient of 3.919536, growth of real income in migrants' host country has been identified as the single most important macroeconomic factor determining remittance of inflows in SSA during the past decade. A percentage rise in migrant-host country income raises migrant remittances received by about 3.9% in a typical SSA country. This finding supports the view that SSA countries that have more of their nationals resident in high-income countries are more likely to receive higher remittances than their counterparts that have relatively less citizens in high-income countries. This finding is consistent with both pure altruistic and pure self-interest theories underlying the flow of migrant remittances and validates many previous findings by El-Sakka and McNabb (1999), Bouhga-Hagbe (2004), Gupta (2005), IMF (2005), Singh et al. (2010), and Adenutsi et al. (2011). However, the positive impact of host-country income on remittance flows to labour-exporting countries as found in this study is in sharp contrast with the negative result obtained by Freund and Spatafora (2005) for 104 selected countries from EAP, ECA and SSA. The contradiction between this result and what was obtained by Freund and Spatafora (2005) might be due mainly to the many data adjustments made by the latter to cater for missing data in the dependent variable measured as the sum of workers' remittances, compensation of employees and migrant transfers as a ratio of population and as per migrant unlike in our case where remittances were measured consistently across the sampled countries as a percentage of GDP. Furthermore, differences in sample units and sample size, methodology (in Freund and Spatafora (2005) fixed-effects 2SLS rather than dynamic model was used), and differences in the sets of explanatory variables used might be the reasons for the variations in results.

The growth of income of the migrant's native country is also statistically significant in determining the amount of migrant remittances received, but with remittances declining in response to increases in home-country income. Consistent with the pure altruistic motive, when the income of a migrant's home country rises by 1%, remittances sent by migrants decline by as much as 0.986%. This finding confirms previous results obtained by Niimi and Özden (2006) for 85 sampled countries, Singh et al. (2010) for 36 SSA countries, and Adenutsi et al. (2011) for 36 SSA countries over the same decade 2000-2009. At the same time, this result contradicts what was obtained by Freund and Spatafora (2005) for 104 developing countries, Lueth and Ruiz-Arranz (2007) in the case of Sri Lanka, and Adenutsi et al. (2011) for a sample of 36 SSA countries for the overall study period, 1980-2009. Apart from differences in empirical model, sample units and size, and time period covered, the differences in the measurement of remittances as noted above could also be the contributing factor for the inconsistency in the results of these two studies.

One other key finding of this study is that business cycle differential, proxied by annual growth in real GDP per capita PPP between a migrant's host country and that of the migrant's home country, is statistically significant and positive in determining migrant remittance inflows in SSA countries (Table 3, Model II). Thus, as the real income of a migrant increases above the increase of the real income of his/her family at home, the migrant is motivated to remit more funds home. This is a further justification for the case of altruism as a key motivating factor behind remittance flows. In this case, international migrants are compelled to remit more funds home if the disparity in living standards between the migrant's host country and his/her home country continues to widen. This result justifies the conclusions drawn by Chipeta and Kachaka (2005) for Malawi, and Moore and Greenidge (2008) for 15 Caribbean countries. The implication here is that as income gap between SSA and high-income countries does not narrow, remittance inflows will be increasing, suggesting that SSA is likely to continue losing its human resource to the industrialized world as more active labour migrate to the industrialized world in search of greener pastures.

Bank credit to the private sector as a ratio of GDP has been found to be a significant negative determinant of migrant remittances to SSA. On average (Models I and II), a 1% increase in credit allocation to the private sector reduces migrant remittance inflows by a -0.026% in the migrant's home country. This finding validates the altruistic theory of migrant remittances, as with higher access to credit in a migrant's home country, the migrant might consider his/her family to be better-off as far as access to finance is concerned. Indeed, Gupta et al. (2007) argue that one of the reasons why migrants send remittances to their families back home is to smooth access to credit in countries such as those in SSA where the financial system is under-developed and credit constraints are high. This finding also seems to suggest that because altruistic remittances dominate migrant remittances received by SSA countries, whenever access to private sector credit improves at home country, migrants remit less to their families on the assumption that the economic conditions of their families back home has improved with higher access to credit. This result is inconsistent with the positive impact of domestic credit on remittance inflows found by Singh et al. (2010) for 36 SSA countries for the period 1990-2005 probably because, notwithstanding the differences in the measurement of remittances and the methodological approach aforementioned, in the latter, total domestic credit rather than credit to the private sector was used in the estimation. Again, for the 1980-2009 period for a sample of 36 SSA, this finding contradicts with the overall positive impact of private sector credit on migrant remittance inflows obtained by Adenutsi et al. (2011), but at the same time, it confirms the negative result obtained for the 2000-2009 decade by the same source.

Deposit interest rate differential between a typical SSA migrant-home country and the USA as a migrant-host country is statistically significant and a positive determinant of remittance flows to SSA in the long-run, though a very small impact as suggested by the estimated coefficient of 0.00957. This implies that as the disparity in real deposit interest rate between SSA and the USA as a migrant host-country narrows, signifying improved financial efficiency and the integration of the financial market of SSA into the



global financial market, more official remittances flow into SSA. This might be the case because narrowing real interest rate gap between the migrant home country and the migrant host country indirectly implies a reduction in the cost of international money transfer in the migrant's home country. This finding validates the results obtained by Bouhga-Hagbe (2004) for Morocco, Moore and Greenidge (2008) for 15 Latin American countries, but at the same time, our finding is in sharp contrast with those obtained by Singh et al. (2010) for 36 SSA countries. The source of this contradictory finding could, among other things, be attributed to the differences in the measurement of interest rate differential. In our study, real deposit rate differential and not nominal deposit rate differential as in Singh et al. (2010) was used<sup>9</sup>.

For the period under consideration, real exchange rate depreciation is a statistically significant positive factor that explains partial variations in higher migrant remittance flows to SSA. This finding, which is consistent in both estimated models as reported in Table 3, shows that, on average, a 1% depreciation of an SSA migrant's home-country currency against US dollar reduces the inflow of remittances into the sub-region by about 1.31%. This result contradicts those of some previous studies, especially the zero-effect of exchange rate on remittance inflows obtained by Freund and Spatafora (2005) for 104 developing countries, Lueth and Ruiz-Arranz (2007) for Sri Lanka, and Moore and Greenidge (2008) for 15 Latin American countries. Also, this result invalidates those obtained for 36 SSA countries by Adenutsi et al. (2011) for the 2000-2009 decade and for the overall study period, 1980-2009. The reasons for the difference in the result might be due to the difference in the measure of exchange rate. Unlike in this study where real bilateral exchange depreciation was computed using a common base year (the year 2000), exchange rate spread was used in Freund and Spatafora (2005) while real effective exchange rate was used in Moore and Greenidge (2008). However, our result is consistent with those obtained by Bouhga-Hagbe (2004) for Morocco, Jadhav (2003) and Gupta (2005) for India, and Singh et al. (2010) for 36 SSA countries. The possible reasons behind the positive impact of real exchange rate depreciation on migrant remittance inflows are not far-fetched. Firstly, self-interest-driven migrants who remit part of their earnings home for investment purposes might be remitting more dollars as these migrants might consider it cheaper to finance business and other entrepreneurial initiatives with few dollars. Secondly, altruistic-driven migrants might also be inclined to remitting more funds to his/her family back home when the domestic currency of his/her native country depreciates, on the possible assumption that cost of living at home has worsened, especially in import-dependent countries as is the case for SSA countries.

Another interesting finding is that improved institutional quality positively impacts migrant remittance inflows in SSA, probably giving further evidence for the self-interest motive of remittances. In this case, SSA nationals living abroad are induced to remit more funds home using official money transfer channels as the political conditions and governance issues improve in their home countries. In other words, in response to improved governance and political stability in the sub-region, SSA international emigrants are encouraged to remit more funds home, probably because,



for self-interest purposes, these migrants may become more inclined to returning to their native countries. Another possible justifiable reason for this finding is that, since law enforcement is improved under democratic governments, black market activities are likely to reduce as SSA institutions are developed. Under this circumstance, underground economic transactions such as informal exchange rate markets may become more effectively illegalized, forcing migrants to use official money transfer channels when remitting to their families back home. This finding validates the result obtained by Gupta (2005) for India and Singh et al. (2010) for 36 SSA countries but contradicts those obtained by Adenutsi et al. (2011) for 36 SSA countries, probably due to differences in sample size and set of explanatory variables.

The home-country inflation rate has a positive impact on remittance inflows, giving further evidence for the altruistic motive behind the flows of remittance to SSA over the past decade. The average estimated coefficient of inflation in the model involving remittances is 0.020515, suggesting that, overall, higher rates of inflation in SSA are associated with higher inflow of remittances, which is consistent with previous findings by El-Sakka and McNabb (1999) for Egypt and Moore and Greenidge (2008) for 15 Caribbean countries, but in contrast with those obtained by Adenutsi et al. (2011) for a panel of 36 SSA countries. This implies that when economic conditions in a migrant's home country worsen in terms of reduced purchasing power of incomes in the domestic economy, the international migrant is compelled to remit more funds home to support his/her family. This result also confirms self-interest motives since rising inflation suggests the emigrant must remit more to complete whatever projects he/she undertakes at home.

## 6. Summary, conclusions and policy recommendations

The central motivation for this paper was to identify the macroeconomic factors that influence migrant remittance flows to SSA. This motivation stemmed from the fact that although migrant remittance inflows have been increasing in recent years, SSA has consistently been the least recipient in actual volumes and relative to population size. To start with, the paper provided some stylized facts regarding remittance flows to SSA over the past four decades. Due to lack of consistent country-specific data, however, 38 out of the 48 SSA countries were sampled for a rigorous econometric analysis over the period 2000-2009. Based on both the theoretical and empirical literature review, two sets of empirical dynamic panel-data models were formulated to establish the relationship between remittance flows and macroeconomic variables. Consequently, we employed the Blundell-Bond system GMM dynamic panel-data methodology in the analysis of the problem under investigation.

Our results seem to suggest that migrant remittances to SSA are mostly driven by altruism rather than self-interest motive, and even though we acknowledge that altruistic and self-interest motives are not mutually exclusive, it is prudent to suppose that altruism would always precede the self-interest motive, based on evidence on the uses of remittances at the household level. Therefore, if migrant remittances only in excess of achieving altruistic motives such as meeting basic human needs of the recipient are normally meant for fulfilling self-interest motives such as building a residential apartment or financing an entrepreneurial activity, then countries that are receiving only 'altruistic remittances' cannot be said to have been receiving optimal remittances. The receipt of mostly 'altruistic remittances' by SSA as revealed in our results might be because the macroeconomic conditions in a typical SSA migrant's home country might not be attractive enough to cause a migrant to invest at his/her native country.

More specifically, the results show that the key macroeconomic determinants of migrant remittances received by SSA countries are home-country real GDP per capita PPP growth (used as the proxy for family income), real GDP per capita PPP growth of USA (used as the proxy for migrant income), business cycle differential between the migrant host country and the migrant home country), and strictly home-country factors such as the CPI-based rate of inflation, real deposit interest rate differential, real exchange rate depreciation, private sector bank credit, and institutional quality and remittance inflows inertia. Whereas the annual growth of home-country real GDP

per capita PPP representing family income and bank credit to the private sector have significant depressing effects on migrant remittances received by SSA countries, other macroeconomic factors including migrant host-nation real GDP per capita PPP growth representing migrant income, income differential between migrant home country and the migrant host country, real exchange rate depreciation, rate of inflation, and deposit interest rate differential together with past remittances and institutional quality, have positive effects on migrant remittance inflows to SSA.

From our stylized facts, initial remittances received are likely to be used for consumption purposes but, over time, the uses of remittances are likely to be switched in favour of non-consumption purposes such as investment into housing, holding of financial assets and entrepreneurial activities. Therefore, if migrant remittances received by SSA countries are largely driven by altruism, then the remittances received by the sub-region are below optimum. It further implies that if migrant remittances received by SSA are essentially driven by altruism, which as literature suggests connotes 'forced remittances', then if the macroeconomic environment of SSA improves, more migrant remittances are likely to be received as higher self-motive driven remittances increase to complement the altruistic motive. It is only at this point that remittance-recipient countries can fully harness the developmental impact of these remittances.

From the findings of our study, the following policy guidelines are suggested for SSA countries as measures towards attracting optimal official migrant remittances:

- There is need to implement sound macroeconomic policies, and enhance financial reforms and openness so as to promote competitiveness within the banking sector. The fact that bank credit to the private sector dampens inflow of remittances to SSA as indicated by the empirical results does not mean that access to bank credit is not good for the economies in SSA. Indeed, what this result implies is that access to credit by the private sector has not reached the level that will elicit self-interest remittance inflows. Therefore, as domestic banking sector becomes increasingly competitive, credit and money deposit institutions may be compelled to open new branches in remote areas to offer basic financial services for the unbanked, which would in the long-run help in formalizing the informal financial market activities and thereby facilitate the transfer of funds including remittances through formal channels. In fact, competition might even compel SSA banks to open branches beyond national and regional borders in their bid to mobilize more funds of which migrant remittances could be a part. Increased competition among banks can also lead to the establishment of Automated Teller Machines (ATMs) with international accessibility in rural and semi-urban communities where migrants' families reside, which will help in promoting remittance through official channels.
- High commissions charged by banks and Money Transfer Operators (MTOs) such as the Western Union and MoneyGram and other related transaction cost associated with remitting through official channels are a disincentive for the patronage of

formal money transfer channels. The high charges on international funds transfers persuade SSA migrants to continue patronizing the services of the relatively cheaper informal remittance transfer agents. Therefore, policies towards further deregulation and development of SSA financial markets to promote competition and efficiency among banks and other formal financial institutions that would result in these institutions adopting cost-saving and other innovative practices in remittance mobilization from migrants should be pursued. Some of the innovative strategies are the introduction of offshore banking facilities, which would create the opportunity for holding joint accounts involving an SSA migrant and his/her spouse, business partner or direct dependent. Financial sector reform policies must also aim to eliminate all bureaucratic procedures involved in licensing new banks and other institutions such as post offices and supermarkets that might want to be agents of MTOs, especially in remote areas.

- The positive impact of real exchange rate depreciation and higher rate of inflation on remittance inflows in SSA is only a demonstration of the fact that migrant remittances received by the sub-region are driven partly by altruism and self-interest motives. Therefore, since altruism and self-interest motives are not mutually exclusive, SSA countries must implement macroeconomic policies aimed at reducing exchange rate misalignments, especially over-valuation of domestic currencies to attract optimal remittances from their nationals living abroad. Monetary and exchange rate policies should be pursued in such a way that SSA economies remain internationally competitive. More importantly, SSA countries should diversify their export base and add value to their export goods to withstand the frequent turbulence in the global primary commodity markets. As the migrant's home country becomes more competitive with the external sector booming and ultimately leading to expansion of domestic output and income, the migrants might regain confidence in their home-country's economy and remit more funds in excess of meeting only altruistic goals.
- The negative effect of growth in real per capita GDP on remittance inflows is further evidence that SSA countries might, for the period under investigation, be attracting mostly altruistic remittances. Macroeconomic policies that will ensure rapid economic growth and equitable distribution of income should be pursued to narrow the income gap between the rich and the poor in SSA. As the standard of living in a migrant's home country improves, he/she might now have a higher desire to return home in the future and, therefore, the higher propensity to remit more funds home for not only altruism but also self-interest purposes. For example, with higher economic prospects in SSA, self-interest seeking SSA migrants may be induced to remit more funds home for investment purposes.
- Remittance-related regulations and policies including reforms with incentive packages arising from reforms in taxation and foreign exchange rate policies

should be pursued by SSA countries to encourage the official flow of migrant remittances. For instance, SSA countries can waive taxes on remittances received as is the case in many LAC, SAS and EAP countries. Also, the existence of dual exchange rate system can be an incentive for SSA migrants to patronize the use of unofficial channels to remit their families back home. Therefore, there should be reforms aimed at abolishing parallel exchange rate markets, especially because of the usually high black market premium.

- Finally, because institutional quality has a significant positive impact on official remittances received in SSA, it is recommended that governments put in place measures to promote political stability, good governance and law and order. This might be a positive signal to SSA migrants to remit more funds to their native countries with renewed aspiration for future return to their home countries and, therefore, the need to finance income-generating projects at home. Also, since democracy is often associated with improved enforcement of law and order, it should be possible to do away with the use of unofficial money transfer channels as a means of mobilizing higher official remittances in SSA.

On the whole, this study has established the relationships between macroeconomic variables and migrant remittances received by SSA countries between the year 2000 and 2009. The study has also proffered notable recommendations on how SSA countries can attract more remittance inflows through official channels. Key policy issues are to further develop the domestic financial sector, ensure that the SSA economy is on a stable path of growth, and make the domestic currency internationally competitive. It behoves, therefore, on policy makers in SSA countries to implement these recommended policy measures to catch up with the rest of the developing world in terms of remittance receipts.

This study is limited to 38 SSA countries over the period 2000-2009 based strictly on consistent country data for the construction of a highly balanced panel data. The main limitation of this study is the quality of data on migrant remittances which is well-known to be under-estimated for many developing countries, particularly those in SSA. This is because the actual amount of migrant remittance flows to the sub-region is not known as unofficial routes are used by migrants in remitting home. Apart from the bureaucratic procedures involved in remitting through official sources, high commissions on international transfers due to under-development of the domestic financial sector and illegal status of migrants from the sub-region are believed to have contributed to the under-reported official statistics on remittance inflows. The interpretation of the results of this study should, thus, be restricted to official migrant remittances received by SSA.

## Notes

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2. The World Bank (2006) estimates that at least 50% of officially reported remittances received by developing countries are sent through unofficial channels.
3. According to Migration Policy Institute (2006), SSA exports over 20% of its tertiary graduates to the industrialized world, but in the case of the other developing regions, for example MENA, less than 10% of the tertiary graduates are exported. Some SSA countries viz. Angola, Guinea-Bissau and Mozambique, for instance, had more than 50% of their tertiary graduates as workers in industrialized countries.
4. In Singh et al. (2010), remittances were measured as the sum of workers' remittances and compensation of employees, which are components of income under current account, plus migrant transfers which are reported under capital account of the Balance of Payments. Apart from the fact that the inclusion of migrant transfers in the measurement of remittances is injudicious, given its unique features, the authors also failed to use the sum of these three components as a measure of remittances consistently for all the 36 sample countries. Indeed, for some of the sampled countries, the authors used only one of the components (say, migrant transfers) to measure remittances, while for others either any of the two components were used or all the three components were summed up to measure remittances.
5. Freund and Spatafora (2005) find that a 100% rise in stock of migrants causes a 75% rise in remittance inflows.
6. This is expected to be the case because altruistic remittances are sent to smooth consumption and credit constraint of recipients, but self-interest remittances are sent

mainly for investment and finance of entrepreneurial activities of which the remitter has a personal interest. Therefore, because financial development is often associated with economic progress, migrants who remit to families back home for altruistic reasons are very likely to reduce remitting for family consumption when the economic conditions of recipients improve. And with improved economic conditions at home, migrants who previously might have lost interest in returning home because of poor economic conditions and low living standards at home might now be motivated to return home, therefore the renewed interest to invest at home. Accordingly, with the progressive developments in the financial sector of SSA, SSA migrants might remit more funds to their home countries for business and entrepreneurial motives in which the migrants themselves might have personal interest as entrepreneurs prefer equity capital to debt capital because the former has no repayment obligation with interest appertaining thereon.

7. A similar conclusion can be drawn in the case of South Africa which, though is the 5th largest migrant remittance recipient in actual volumes, is ranked among the bottom-10 remittance recipients when measured as a proportion of GDP. Uganda, Lesotho, Mauritius, Togo, Gambia, Liberia, and Guinea-Bissau, each of which received less migrant remittances in actual volumes than South Africa, are ranked among the top-10 remittance recipients when measured as a proportion of GDP due to their relative small GDP.
8. The Vargas-Silva and Huang (2006) theoretical framework for analyzing the macroeconomic determinants of remittances was formulated in line with Lucas and Stark (1985) to comprise the inclusion of migrant income and family income, or income differential for capturing altruistic remittances and interest rate differential for capturing self-interest motive of remittances. In our study, this model has been expanded to include other home-country macroeconomic variables viz. private sector credit, exchange rate depreciation, inflation, and institutional quality. This expanded modification is necessary to enable us to come out with more comprehensive macroeconomic policies towards attracting optimal flow of official remittances to SSA.
9. In both studies, interest differential was computed as home-country deposit interest rate less host-nation deposit interest rate.

## References

- Adams, Richard H. Jr. 2006. Remittances and poverty in Ghana. World Bank Policy Research Working Paper 3838. Washington, DC: World Bank.
- Adams, Richard H. Jr. and John, Page. 2005. "Do international migration and remittances reduce poverty in developing countries?" *World Development*, 33 (10): 1645–1669.
- Adenutsi, Deodat E. 2010a. "Long-run macroeconomic impact of international migrant remittances on human development in low-income countries: A panel analysis of Sub-Saharan Africa". *Journal of International Economic Studies*, 24 (March): 113–132.
- Adenutsi, Deodat E. 2010b. "Do international remittances promote human development in poor countries? Empirical evidence from Sub-Saharan Africa". *International Journal of Applied Economics and Finance*, 4: 31–45.
- Adenutsi, Deodat E. 2011. "Financial development, international migrant remittances and endogenous growth in Ghana". *Studies in Economics and Finance*, 28(1): 68–89.
- Adenutsi, Deodat E. and Christian R.K. Ahoritor. 2008. "Remittances, exchange rate and monetary policy in Ghana". *West African Journal of Monetary and Economic Integration*, 8(2): 1–42.
- Adenutsi, Deodat E., Meshach J. Aziakpono and Matthew K. Ocran. 2011. "The changing impact of macroeconomic environment and remittance inflows in Sub-Saharan Africa". *Journal of Academic Research in Economics*, 3(2): 136–167.
- Ahlburg, Dennis A. 1991. *Remittances and their impact: A study of Tonga and Western Samoa*. Canberra: National Centre for Development Studies.
- Ahmed, Ismail I. 2000. "Remittances and their economic impact in post-war Somaliland". *Disasters*, 24(4): 380–389.
- Ahoritor, Christian R.K. and Deodat E. Adenutsi. 2009. "The impact of remittances on economic growth in small-open developing economies". *Journal of Applied Sciences*, 9(18): 3275–3286.
- Arellano, Manuel and Stephen Bond. 1991. "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations". *Review of Economic Studies*, 58: 277–297.
- Arellano, Manuel and Olympia Bover. 1995. "Another look at the instrumental variable estimation of error-components models". *Journal of Econometrics*, 68: 29–51.
- Aydaş, Osman T., Bilin Neyapti and Kivilcin Metin-Özcan. 2004. *Determinants of workers' remittances: The case of Turkey*. Department of Economics Working Paper 0405. Ankara: Bilkent University.
- Blundell, Richard W. and Stephen Bond. 1998. "Initial conditions and moment restrictions in dynamic panel data models". *Journal of Econometrics*, 87: 115–143.



- Bond, Stephen. 2002. *Dynamic panel data models: A guide to micro data methods and practice*. Cemmap Working Paper CWP 09/02. The Institute for Fiscal Studies, London: Centre for Microdata Methods and Practice.
- Borovnik, Maria. 2003. *Seafarers in Kiribati: Consequences of international labour circulation*. Unpublished PhD thesis. Christchurch: University of Canterbury.
- Borovnik, Maria. 2004. *Seafarer remittances to Kiribati: Where do the benefits fall? A paper presented at 'Beyond MIRAB: the Political Economy of Small Islands in the 21<sup>st</sup> Century'*. Wellington: Victoria University.
- Bouhga-Hagbe, Jacques. 2004. *A theory of workers' remittances with an application to Morocco*. IMF Working Paper 04/194, Washington DC: International Monetary Fund.
- Bouhga-Hagbe, Jacques. 2006. *Altruism and workers' remittances: Evidence from selected countries in the Middle East and Central Asia*. IMF Working Paper 06/130, Washington DC: International Monetary Fund.
- Boyd, David J. 1990. "New wealth and old power: Circulation, remittances and the control of inequality in an Eastern Highlands Community, Papua New Guinea". In John Connell (ed), *Migration and development in the South Pacific*. Canberra: National Centre for Development Studies, Australian National University.
- Brown, Richard P.C. 1995. *Consumption and investments from migrants' remittances in the South Pacific*. Geneva: International Labour Organization.
- Brown, Richard P.C. 1997. "Estimating the remittance functions for Pacific migrants". *World Development*, 25(4): 613–626.
- Brown, Richard P.C. and John Connell. 1993. "The global flea market: Migration, remittances and the informal economy in Tonga". *Development and Change*, 24: 611–647.
- Brown, Richard P.C. and Bernard Poirine. 2005. "A model of migrants' remittances with human capital investment and intrafamilial transfers". *International Migration Review*, 39(2): 407–438.
- Chipeta, Chinyamata and Willie Kachaka. 2005. *Role of migrants' remittances in unstable low-income economy: A case study of Malawi*. Chancellor College Working Paper 2005/05. Zomba: University of Malawi.
- Clark, Phil. 2004. *The economic impact of contracted labour upon the livelihoods of small Pacific Island states: An examination of the expenditure patterns of I-Kiribati and Tuvaluan seafarers and the dependents*. Unpublished Masters of Social Planning and Development Thesis, University of Queensland.
- Connell, John. 1980. *Remittances and rural development: Migration, dependency and inequality in the South Pacific*. National Centre for Development Studies Occasional Paper No. 22. Canberra: Australia National University.
- Cox, Donald and Oded Stark. 1994. *Intergenerational transfers and the demonstration effect*. Boston College Working Papers in Economics 329. Boston: Boston College.
- De la Bière, Benedicte, Elisabeth Sadoulet, Alain de Janvry and Sylvie Lambert. 2002. "The roles of destination, gender and household composition in explaining remittances: An analysis for the Dominican Sierra". *Journal of Development Economics*, 68: 309–328.
- Dennis, Jennifer. 2003. *Pacific Island seafarers: A study of the economic and social implications of seafaring on dependants and communities*. Research Report for the Pacific Seafarers Training Project, Regional Maritime Programme. Suva: Secretariat of the Pacific Community.

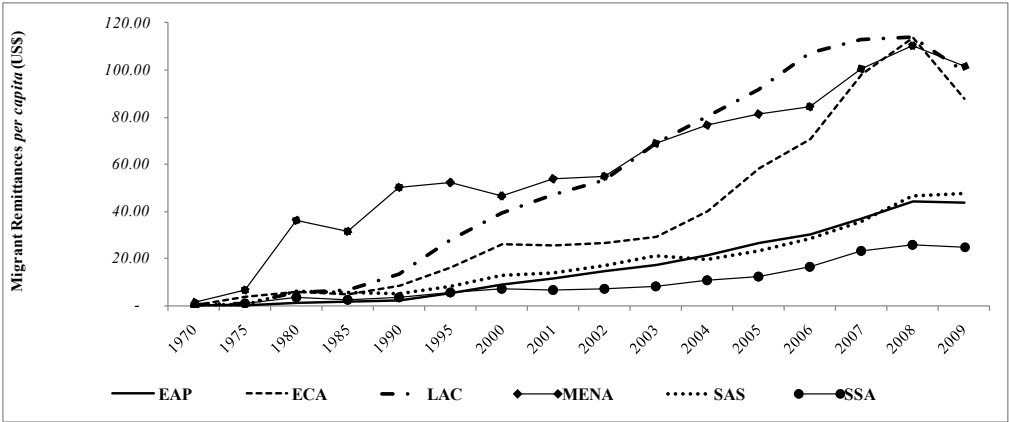
- Diatta, Marie A. and Ndiaga Mbow. 1999. "Releasing the development potential of return migration: The case of Senegal". *International Migration*, 37(1): 243–266.
- El-Sakka, Mohammed I.T. and Robert McNabb. 1999. "The macroeconomic determinants of emigrant remittances". *World Development*, 27(8): 1493–1502.
- Faeamani, Sione U. 1995. "The impact of remittances on rural development in Tongan villages". *Asian and Pacific Migration Journal*, 4: 139–156.
- Faini, Riccardo. 2003. *Is the brain drain an unmitigated blessing?* UNU-WIDER Discussion Paper 2003/64, September 2003.
- Findley, Sally E. and Salif Sow. 1998. "From season to season: Agriculture, poverty, and migration in the Senegal river valley, Mali". In Appleyard, R. (ed), *Emigration dynamics in developing countries: Sub-Saharan Africa*. London: Ashgate Publishing.
- Freund, Caroline and Nikola Spatafora. 2005. *Remittances: Transaction costs, determinants, and informal flows*. World Bank Policy Research Working Paper, 3704 (September): 1–42.
- Gubert, Flore. 2000. *Migration et Gestion Collective des risqués, L'exemple de la Region de Kayes (Mali)*. Unpublished PhD Dissertation. University of Clermont-Ferrand.
- Gubert, Flore. 2002. "Do migrants insure those who stay behind? Evidence from the Kayes area (Western Mali)". *Oxford Development Studies*, 30(3): 267–287.
- Gupta, Poonam. 2005. *Macroeconomic determinants of remittances: Evidence from India*. IMF Working Paper 05/224, Washington DC: International Monetary Fund.
- Gupta, Sanjeev, Catherine Patillo and Samir Wagh. 2007. *The impact of remittances on poverty and financial development in Sub-Saharan Africa*. IMF Working Paper 07/38. Washington DC: International Monetary Fund.
- Hagen-Zanker, Jessica and Melissa Siegel. 2007. *The determinants of remittances: A review of the literature*. Maastricht University Graduate School of Governance Working Paper 003 (June).
- Hansen, Lars P. 1982. "Large sample properties of Generalized Method of Moments estimators". *Econometrica*, 50(3): 1029–1054.
- Hayes, Geoffrey. 1993. "Mirab processes and development on small Pacific Islands: A case study from the Southern Massim, Papua New Guinea". *Pacific Viewpoint*, 34: 153–178.
- Higgins, Matthew L., Alketa Hysenbegasi and Susan Pozo. 2004. "Exchange rate uncertainty and workers' remittances". *Applied Financial Economics*, 14(6): 403–411.
- International Monetary Fund - IMF. 2005. *Two current issues facing developing countries*. World Economic Outlook, April 2005: Globalization and External Imbalances, World Economic and Financial Surveys. Washington DC: International Monetary Fund.
- Jadhav, Narendra. 2003. "Maximizing developmental benefits of migrant remittances: The Indian experience". Paper presented at the Joint Conference of DfID-World Bank, London: October 9–10.
- James, Kerry E. 1991. "Migration and remittances: A Tongan village perspective". *Pacific Viewpoint*, 32(1): 1–23.
- James, Kerry E. 1993. "Cash and kin: Aspects of migration and remittances from the perspective of a fishing village in Vava'u, Tonga". In G. McGall and John Connell (eds), *A world perspective on migration: Australia, New Zealand and the USA*. Sydney: Centre for South Pacific Studies, University of New South Wales.

- Loomis, Terry. 1990. "Cook Island remittances: Volumes, determinants and uses". In John Connell (ed), *Migration and development in the South Pacific*. Pacific Research Monograph No. 24. Canberra: National Centre for Development Studies, Australian National University.
- Lucas, Robert E.B. and Oded Stark. 1985. "Motivations to remit: Evidence from Botswana". *Journal of Political Economy*, 93(5): 901–918.
- Lueth, Erik and Marta Ruiz-Arranz. 2007. *Are workers' remittances a hedge against macroeconomic shocks? The Case of Sri Lanka*. IMF Working Paper 07/22, Washington DC: International Monetary Fund.
- Marshall, Monty G. and Keith Jagers. 2011. *Polity VI Country Reports 2011 Database*. University of Maryland: Centre for International Development and Conflict Management.
- McCormick, Barry and Jackline Whaba. 2001. "Overseas work experience, savings and entrepreneurship amongst returnee migrants in LDCs". *Scottish Journal of Political Economy*, 48: 164–178.
- Migration Policy Institute. 2006. *Remittances profile: Sub-Saharan Africa*. Available online at: <http://www.migrationpolicy.org/datahub>. Accessed: 26 January 2010.
- Miotti, Luis, El Mouhoub Mouhoub and Joel Oudinet. 2010. *Determinants and uses of remittances to Southern and Eastern Mediterranean countries: Insights from a New Survey*. Development Studies Working Paper 288. Centro Studi Luca D'Agliano.
- Moore, Alvon and Kevin Greenidge. 2008. *Determinants and volatility of remittances in the Caribbean*. A paper presented at the 29<sup>th</sup> Annual Review Seminar. Bridgetown: Central Bank of Barbados, July 28–31, 2008.
- Morauta, Louise. 1985. "Urban movement and rural identity: A Paupa New Guinea example". In M. Chapman (ed), *Mobility and identity in the Island*, Pacific Viewpoint (Special Issue), 26: 221–241.
- Muliaina, Tolu. 2001. "Remittances, the special system and development in Samoa". In V. Naidu, E. Vasta and C. Hawksley (eds), *Current trends in South Pacific migration*. Asia Pacific Migration Research Network Working Paper No. 7: 20–40. Wollongong: Centre for Asia Pacific Social Transformation Studies.
- Mundaca, Gabriela B. 2005. *Can remittances enhance economic growth: The role of financial markets development*. Mimeo, Department of Economics, University of Oslo.
- Mutume, Gumisai. 2005. "Workers' remittances: A boon to development". *Africa Renewal*, 19(3, October): 10–19.
- Niimi, Yoko and ađlar Özden. 2006. *Migration and remittances: Causes and linkages*. World Bank Policy Research Working Paper 4087. Washington DC: World Bank.
- Poirine, Bernard. 1997. "A theory of remittances as an implicit family loan arrangement". *World Development*, 25 (January): 589–611.
- Rapoport, Hillel and Frédéric Docquier. 2006. "The economics of migrants' remittances". In Gerard V. Kolm and J. Mercier-Ythier (eds), *Handbook on the economics of reciprocity, giving and altruism*, Vol. 2. Amsterdam: North-Holland.
- Rensel, Jan. 1993. "The Fiji connection: Migrant involvement in the economy of Rotuma". *Pacific Viewpoint*, 34: 215–240.
- Roodman, David. 2006. "How to Do xtabond2: An Introduction to "Difference" and "System" GMM in Stata, Centre for Global Development Working Paper 103 (December), Centre for Global Development.

- Russell, Sharon S. 1986. "Remittances from international migration: A review in perspective". *World Development*, 14(June): 677–696.
- Sargan, Thomas J. 1958. "The estimation of economic relationships using instrumental variables". *Econometrica*, 26(3): 393–415.
- Sayan, Serdar. 2006. *Business cycles and workers' remittances: How do migrant workers respond to cyclical movements of GDP at home?* IMF Working Paper 06/52. Washington DC: International Monetary Fund.
- Scott, Gwen G. 2003. "Situating Fijian transmigrants: Towards racialised transnational social spaces of the undocumented". *International Journal of Population Geography*, 9: 181–198.
- Shankman, Paul. 1976. *Migration and underdevelopment: The case of Western Samoa*. Boulder: Westview Press.
- Singh, Raju J., Markus Haacker, Kyung-woo Lee and Maëlan Le Goff. 2010. "Determinants and macroeconomic impact of remittances in Sub-Saharan Africa". *Journal of African Economies*, 20(3): 312–340.
- Swamy, Gurushri. 1981. *International Migrant Workers' Remittances: Issues and Prospects*. World Bank Staff Working Paper 481. Washington DC: World Bank.
- Taylor, J. Edward. 1996. "International migration and national development". *Population Index*, 62(2): 181–212.
- Tongamo, Taiamoni. 1987. *Migration, remittances and development: A Tongan perspective*. Unpublished Master of Arts Thesis. University of Sydney.
- Vargas-Silva, Carlos and Peng Huang. 2006. "Macroeconomic determinants of workers' remittances: Host vs home country's economic conditions". *Journal of International Trade and Economic Development*, 15(1): 81–99.
- Walker, Adrian M. and Richard P.C. Brown. 1995. "From consumption to savings? Interpreting Tongan and Western Samoan sample survey data on remittances". *Asian and Pacific Migration Journal*, 4(1): 89–115.
- World Bank. 2006. *Global Economic Prospects: Economic Implications and Migration*. Washington DC: World Bank.
- World Bank. 2010a. *Global Development Finance*, October. Washington DC: World Bank.
- World Bank. 2010b. *World Development Indicators*, October. Washington DC: World Bank.
- World Bank. 2010b. *World Development Indicators*, October. Washington DC: World Bank.
- Yang, Dean and HwaJung Choi. 2007. "Are remittances insurance? Evidence from rainfall shocks in the Philippines". *World Bank Economic Review*, 21(2): 219–248.

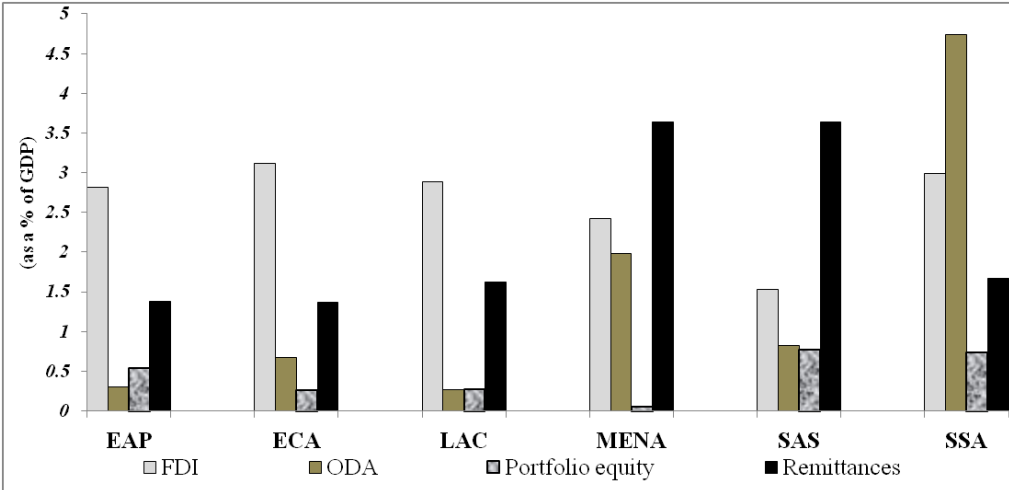
# Appendix

Figure A1: Trends in global inflow of migrant remittances per capita, 1970-2009



Source: Authors based on World Bank (2010a and 2010b)

Figure A2: External capital flows to developing economies, 2000-2009 (annual average)



Source: Authors based on WDI & GDF April 2011

Table A1: SSA countries ranked by income status (based on 2000-2009 average)

Rank	Country	GNI per capita, PPP (constant 2005 US\$)	Rank	Country	GNI per capita, PPP (constant 2005 US\$)	Rank	Country	GNI per capita, PPP (constant 2005 US\$)
1	Seychelles	16,558	16	Senegal	1,542	31	Uganda	896
2	Equatorial Guinea	12,043	17	Lesotho	1,533	32	Madagascar	878
3	Gabon	11,233	18	Cote d'Ivoire	1,498	33	Guinea	856
4	Botswana	10,676	19	Sudan	1,496	34	Rwanda	838
5	Mauritius	10,313	20	Kenya	1,330	35	Togo	761
6	South Africa	8,294	21	Benin	1,301	36	Central African Republic	680
7	Namibia	5,278	22	Ghana	1,178	37	Ethiopia	644
8	Swaziland	4,320	23	Comoros	1,094	38	Mozambique	621
9	Angola	3,242	24	Gambia	1,065	39	Malawi	619
10	Cape Verde	2,650	25	Tanzania	1,041	40	Eritrea	618
11	Congo, Rep.	2,416	26	Zambia	1,037	41	Niger	606
12	Cameroon	1,876	27	Burkina Faso	1,005	42	Sierra Leone	602
13	Mauritania	1,689	28	Guinea-Bissau	954	43	Burundi	340
14	São Tomé & Príncipe	1,664	29	Mali	936	44	Liberia	286
15	Nigeria	1,553	30	Chad	929	45	Congo, Dem. Rep.	247

Source: Authors based on World Bank (2011), WDI and WEO (April 2011). Note: This

Table does not include Mayotte, Somalia and Zimbabwe due to unavailability of data.

Table A2: Data measurement, sources and expected impact on remittance inflows

Variable	Notation*	Description, Measurement and Sources
<b>Dependent Variables</b>		
Remittances/ GDP	REMGDP	The sum of two items in the IMF's Balance of Payments Statistics Yearbook (BoPS) viz. workers' remittances and compensation of employees as a ratio of GDP. Source: World Bank, World Development Indicators; and GDF based on BoPS
<b>Explanatory Variables</b>		
Initial/lagged Remittances	$\mathfrak{R}_{t-\rho} +$	The optimal lag of the dependent variable (REMGDP) to SSA. Source: Authors' computations from Source: World Bank, World Development Indicators and Global Development Finance
Institutional Quality	NSQ+	Institutional quality index as computed and named as Poliy2 to reflect the qualities of democratic governance and institutions on a scale of -10 (lowest as under dictatorship and autocratic regimes) to +10 (highest as under democratic governance and strong institutions). Source: Marshall and Jagers (20011)

continued next page

Table A2 Continued

Variable	Notation*	Description, Measurement and Sources
Explanatory Variables		
Host-Country Income	$Y^{f+}$	The natural logarithm of real per capita GDP at constant 2005 price in US\$ of a migrant host country, proxied by the United States of America. Source: World Bank, World Development Indicators
Private Sector Credit	$PSC^{+/-}$	Bank credit to the private sector as a ratio of GDP in a typical SSA country. Source: World Bank, World Development Indicators and authors' own computation from various central bank sources
Home-Country Income	$Y^{+/-}$	The natural logarithm of real per capita GDP at constant 2005 price in US\$ of a migrant remittance receiving SSA country. Source: World Bank, World Development Indicators and World Economic Outlook
Income Differentials	$YDF^{+/-}$	The natural logarithm of the difference between the income of a migrant ( $Y^f$ ) minus the income of his/her family resident in SSA ( $Y^h$ ). Source: Authors' computation based on World Bank, World Development Indicators and World Economic Outlook
Inflation Rate	$INF^{+/-}$	Annual percentage growth in consumer price index of a typical SSA country. Source: WDI and authors' computations from World Bank, World Economic Outlook.

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Table A2 Continued

Variable	Notation*	Description, Measurement and Sources
<b>Explanatory Variables</b>		
Exchange Rate	RXR+/-	The annual average value of the national currency of a sampled SSA country in real terms of the currency of the migrant host, here the US dollar. To make real exchange rate comparable across the sampled countries, year 2000 constant CPI was used and the indices computed were rebased to equal one for the base year 2000. Real exchange rate depreciation was then computed relative to year 2000 on the assumption that, sampled SSA countries have a common exchange rate misalignment pegged on the unitary index of year 2000. Source: Authors' own computations from nominal official exchange rates reported in World Bank and International Monetary Fund - International Financial Statistics, respectively.
Interest Rate Differential	IRD+/-	The annual real average deposit rate of commercial banks in a typical migrant remittance receiving SSA country minus that of USA. Source: Authors' computations from the World Bank compilations based on WDI and WEO.

\*The a priori sign is indicated by + (for positive), - (for negative) and +/- (for indeterminate) in the notation column of each variable.



Table A3: List of sampled SSA countries

Country	Country Code	Country	Country Code
Benin	01	Mali	20
Botswana	02	Mauritania	21
Burkina Faso	03	Mauritius	22
Cameroon	04	Mozambique	23
Cape Verde	05	Namibia	24
Comoros	06	Niger	25
Congo Republic	07	Nigeria	26
Côte d'Ivoire	08	Rwanda	27
Ethiopia	09	São Tome & Príncipe	28
Gabon	10	Senegal	29
Gambia, The	11	Seychelles	30
Ghana	12	Sierra Leone	31
Guinea	13	South Africa	32
Guinea-Bissau	14	Sudan	33
Kenya	15	Swaziland	34
Lesotho	16	Tanzania	35
Liberia	17	Togo	36
Madagascar	18	Uganda	37
Malawi	19	Zambia	38

Source: Authors

Table A4: Estimated results of fixed-effects (FE) model

	Model I	Model II
Income differential (YDF)	.....	1.291058(1.12)
Home-country income ( $Y^h$ )	-1.652035(-1.45)	.....
Host-country income ( $Y^f$ )	11.16124(3.89)***	.....
Financial sector development (FSD)	-0.0122132(-0.71)	0.0096234(0.59)
Institutional quality (NSQ)	-0.17178(-3.07)***	-0.12256(-2.21)**
Rate of inflation (INF)	0.051595(2.43)**	0.04918(2.27)***
Interest rate differential (IRD)	0.044610(1.81)**	0.0253235(1.03)
Real exchange rate (RXR)	0.552887(2.50)**	0.2784691(1.31)
Constant term (Constant)	-102.89780(-3.75)***	-1.066671(-0.27)
F[6, 329]	4.28	2.56
Prob>F	0.0000	0.0194
R-squared	0.9416	0.9391
Adjusted R-squared	0.9337	0.9311
Root MSE	1.3791	1.406
Ccode F[37,328]	136.071{0.000}	130.586{0.000}
Number of observations	373	373
Number of categories	38	38
Observation per group: Min = 6, Avg. = 9.8, Max = 10		

Source: Authors' estimation

Note:\*\*/\*\* stands for significant at 5% and 1% respectively. Z-statistics are in ( ) whilst F-statistics are in { }.



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