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THE IMPACT OF INTERNATIONAL REMITTANCES ON ECONOMIC GROWTH IN SUB-SAHARAN AFRICA

by

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Abstract

A dynamic panel-data model covering 36 SSA countries was estimated following the system GMM estimation procedure. Under the assumption that the effects of remittances on economic growth could vary overtime in response to macroeconomic policy environment in remittance-recipient countries, a decade-based analysis was undertaken. The findings show that, indeed, remittances promote growth under sound macroeconomic environment which is ideal for private sector investment. It was also found that lower-income countries and countries suffering from economic decline are more likely to benefit more from remittances in terms of higher growth provided that these countries have stable macroeconomic conditions. However, higher-income countries and those with higher growth rates can also experience higher positive impact of remittances on long-run growth under investment-friendly conditions provided these countries can succeed in mobilising higher inflows of remittances per capita.

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1.0 INTRODUCTION

Consistent with increasing international migration of active labour from the developing world to the advanced economies in recent years, there has been an upsurge and continuous flow of migrant remittances to the developing world of which Sub-Saharan Africa (SSA) is a part. Without any immediate aspirations for a narrowing income gap between the advanced world and the developing world in this era of increasing collapse of trade barriers under the tenets of globalisation, the South-North trend in international migration is set to continue unabated.

From a mere US$2.05 billion in 1970, the world received remittance inflows increased to US$36.69 billion in 1980; US$68.38 billion in 1990; US$131.49 billion in 2000; US$274.54 billion in 2005 and to US$416.12 billion in 2009. During this same period, SSA received US$0.02 billion; US$1.40 billion; US$1.88 billion, US$4.64 billion; US$9.42 billion and US$20.75 billion respectively. As at 2009, the global official inflows of remittances, emerging as the second-largest external capital in the world (only after foreign direct investment (FDI)) represents 3.39 percent of global goods exports, 35.76 percent of FDI but as much as 326.30 percent, which implies more than thrice the volume of overseas development assistance (ODA). This trend is not too different in the case of SSA as officially reported remittances received by the sub-region represents 8.03 percent of goods exports, 71.31 percent of FDI and 46.62 percent of ODA as of 2009. And from 36 countries in 1980, the number of countries that received remittances representing at least one percent of their GDP increased to 58 in 1990, 81 in the year 2000 before reaching 96 by the end of 2009. Of this figure, 25 countries, including four from SSA[2], received remittances representing more than 10 percent of their GDP by the end of 2009. This could just be one of the key reasons why the implications of international remittances in recipient countries have become increasingly important as far as economic policy research, design and implementation are concerned in recent years.

Apart from the persistent positive growth trend, migrant remittance inflows are known to exhibit a unique feature which clearly distinguishes it from other forms of external capital received by developing countries. Remittances are clearly the least volatile form of external

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[2] SSA countries that received 10 percent or more of remittances as a percentage of GDP in year 2009 are Lesotho (26.23 percent), Gambia (10.88 percent), Togo (10.75 percent) and Senegal (10.64).

capital. It can be inferred from the remittance literature[3] that because the flow of remittances are largely influenced by the altruistic feelings of migrants and for which reason altruism dominates the motives behind remittance inflows, these private transfers, unlike other forms of capital, often increase in response to harsh economic conditions and crisis afflicted by shocks in labour-exporting countries. Another distinguishing feature of altruistic remittances is that it does not carry along any risk or cost to the recipient as it is often directly associated with smoothing consumption of the target recipient.

The theoretical role of remittances in enhancing long-run economic growth in remittance-recipient countries, which also double as labour-exporting developing countries, is not straightforward. From theoretical standpoint, it can be argued that because remittances are used mainly for consumption smoothing and investment in land and other non-tradable assets such as construction or redevelopment of private residential apartments which do not generate income, recipient countries are at risk of being infested with the Dutch disease through exchange appreciation and/or currency overvaluation. In this case, the inflows of remittances can actually inhibit long-run economic growth as export earnings fall due to a significant reduction in international competitiveness of small-open, import-dependent, and remittance-recipient countries, which are traditionally exporters of primary products. The World Bank (2006), however, downplayed the argument for the Dutch disease infestation of remittances as a serious concern because increases in remittances are gradual. To the extent that remittance inflows can exacerbate international dependency, intensify emigration syndrome and reduce labour productivity through moral hazards in recipient countries, some scholars including Wiest (1984), Chami *et al.* (2005), and Kapur (2004) contend that, theoretically, remittances can impair long-run growth in developing countries.

On the reverse side of the argument is the positive role of remittances in enhancing long-run economic growth as these funds are considered as additional income to boost consumption, private investment and thereby create job opportunities for output expansion in capital-constrained labour-exporting countries. In this context, by financing private consumption and entrepreneurial activities, remittances could help increase manufacturing output through increased aggregate demand and, hence, higher private investment and resulting in

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[3] See for instance Johnson and Whitelaw (1974), Stark and Lucas (1988), Giuliano and Ruiz-Arranz (2009), World Bank (2006), Acosta *et al.* (2007), Barajas *et al.* (2009), Mundaca (2009), and Fayissa and Nsiah (2011).

increased demand for labour for industrial output expansion. This suggests that remittances carry along some positive multiplier effects and optimistic externalities, so that by helping to reduce income volatility, minimise credit market failures and smoothing consumption in low-income labour-exporting countries, they help stabilise macroeconomy which is favourable for attracting private investment. Bugamelli and Paterno (2008) and Chami *et al.* (2009) find evidence for an automatic output volatility mitigating element of remittances in remittance-recipient countries. Another important positive effect of remittances is its potential to ameliorate BoP problems which can improve the international credit rating of remittance-recipient countries, that can in the long run, affect both the magnitude and trend in government spending on the provision of public goods and the type of infrastructure that can crowd-in private investment.

The arguments above imply that the effect of remittances on long-run growth is purely an empirical issue in the absence of a theoretical consensus. Unfortunately, however, conclusions from various empirical findings buttress the theoretical controversy surrounding the long-run growth impact of remittances as findings range widely from negative, zero, positive and to conditional effects. For instance, Stark and Lucas (1988), Chami *et al.* (2005), Lee (2008) and Karagöz (2009) conclude from various studies that the impact of remittances on economic growth is negative. IMF (2005), Baldé (2009) and Barajas *et al.* (2009) find zero effect of remittances on economic growth. Other studies including Stark and Lucas (1988), Faini (2002; 2006), Catrinescu *et al.* (2006), Ahortor and Adenutsi (2009), Ziesemer (2008; 2009), and Adenutsi (2011), however, find a direct positive impact of remittances on growth. In connection with indirect or conditional effects of remittances on economic growth, Giuliano and Ruiz-Arranz (2005), Fajnzylber and López (2007) find a substitutability relationship between remittances and financial development, such that, remittances promote long-run growth in countries with poorly developed financial markets and where liquidity constraints are most severe.

Previous studies, however, suffer from various technical deficiencies. One fundamental limitation in previous studies relates to the measurement of remittances to include Balance of Payments (BoP) current account components (i.e. workers' remittances and compensation of employees), and the use of remittances per migrant rather than remittances as a ratio of

GDP. In this study, remittances are defined to include only the two aforementioned current account components because migrants transfers do not flow frequently, and even when they flow, they are mostly received by the returnee migrants themselves. Furthermore, remittances as a ratio to GDP might not yield reliable results as the issue of factor productivity is brought into question, especially in a typical cross-country study. Another important problem with previous studies is that they fail to provide an insight into the possible changing impact of remittances on economic growth in remittance-recipient countries. Some previous studies also try to model the impact of remittances on growth through an *ad hoc* indirect mechanism. This study recognises the fact that the channels through remittances can affect growth could be many[4] and cannot be adequately addressed in one particular empirical study; hence, the need to rather concentrate on how remittances can affect growth as macroeconomic environment evolves in response to the implementation of financial liberalisation policies. These problems are addressed using 36 SSA countries in this study.

The section that follows reviews theoretical and empirical literature on remittances and economic growth. Section 3 presents the stylised facts that also lend support to the choice of the empirical model and methodology in Section 4. The estimated results are presented and analysed in 5 before the concluding remarks and recommendations are outlined in Section 6.

2.0 THE LITERATURE ON INTERNATIONAL REMITTANCES AND ECONOMIC GROWTH

2.1 Theoretical Literature Review

International remittance inflows are an essential component of capital inflows, which like export earnings, are a positive determinant of economic growth in a net labour-exporting country. This is why net remittances can enter directly into the Keynesian macroeconomic framework for output determination of a country where citizenship (in the case of gross national income) rather than residency (in the case of GDP) of labour as an important productive resource is taken into consideration[5]. Theoretically, although net remittances can either be negative, zero, or positive, for a typical labour exporting developing country, net

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[4] For example, remittances can affect indirectly affect through human capital development in terms of improved access to healthcare or higher skills acquisition which are essential for higher labour productivity; financial development by augmenting domestic savings to improve credit extension; increased aggregate demand through consumption of manufactured goods; increased government expenditure on provision critical infrastructure as government revenue increases from import tariffs and consumption tax such as the Value Added Tax (VAT).
[5] For a detailed illustration of how remittance inflows can enter into a Keynesian-type growth accounting national output determination through various channels, see Adenutsi (2011).

remittances are known to be greater than zero[6], which should imply a direct positive impact on national output in these low-income countries. However, like savings, globalisation, financial liberalisation and financial market reforms, the ultimate impact of remittances on economic growth is not straightforward because in as much as remittances have the potential of spurring long-run growth, they can equally exert a negative impact of productivity through the problem of moral hazards in developing countries (Stark and Levhari, 1982; Lipton, 1980; Chami *et al.* 2005; 2009). In a contribution to the formulation of remittances-growth theory, Barajas *et al.* (2009) posit that, theoretically, the effects of remittances on economic growth are transmitted through three main channels – capital accumulation, labour force growth and total factor productivity (TFP) growth - none of which has a one-directional potential impact on long-run growth in remittance-recipient countries. The theories developed by Barajas *et al.* (2009) are not novel as they are essentially parallel to earlier contribution by Rapoport and Docquier (2006) who identify two broad channels[7] through remittances can affect economic growth in remittance-recipient countries.

On the potential positive effects of remittances on long-run growth through capital accumulation, Barajas *et al.* (2003) do not disagree with earlier propositions by Stahl and Arnold (1986), Massey *et al.* (1998), and de Haas (2003), that remittances can contribute to growth by reducing macroeconomic volatility, liquidity and productive investment constraints; raising real income levels, and minimising balance of payments problems in developing countries. Besides, remittance inflows help to narrow the trade gap, control external debt, facilitate debt servicing, increase creditworthiness, and increase supply of foreign exchange in remittance-recipient countries (Adenutsi, 2011). Remittances may also reduce the cost of borrowing in capital-constraint remittance-recipient countries as demand for credit from the household sector reduces and with a higher potential of reducing profit margin and default risk component of quoted lending rates by banks and other financial intermediaries. All these can enhance long-run growth in remittance-recipient countries.

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[6] Available statistics shows that developing countries acting as the major exporters of labour to the industrialised world receive more remittances than remittances paid (see Figure A1 in the Appendix for evidence).
[7] These are the 'liquidity constraint 1: entrepreneurship' and liquidity constraint 2: human capital'. Each of these theories has various cases under it that shows how remittances can potentially affect economic growth in the long run (see Rapoport and Docquier, 2006 for further details). The recent work by Barajas *et al.* (2009) is, however, an adequate representation of Rapoport and Docquier, 2006.

However, the potential positive impact of remittances on economic growth in recipient countries can only manifest itself if remittances are less altruistic hence saved or spent mainly on investment goods rather than on consumption remittance-recipient developing countries that are mostly import-dependent. One important fact is that many developing countries are import-dependent and, therefore, spending remittances on consumer goods is likely to result in a leakage rather than an injection of funds into the income flow of remittance-recipient countries. Indeed, it is conceivable that when remittances become permanent income transfers they are very likely to be spent mainly on consumption of leisure and imported consumer goods[8] rather than being spent on investment goods in remittance-recipient countries, but this is an unlikely in the long run if migrants behave rationally.[9] However, if altruistic remittances are spent on locally-made consumer goods and services, then remittances can propel long-run growth through higher demand for manufactured goods resulting in higher demand for factor inputs by domestic industries as firms expand production to meet increased demand and even target the export market. This can also culminate in higher wages and interest rates, with the potential of reducing emigration and boosting private sector savings and investment that can ultimately entice migrants and recipient of remittances to save or to invest in labour-exporting countries thereby increasing the positive multiplier effects of remittances. Barajas *et al.* (2009) again argue that the remittances-growth channel through capital accumulation could suffer undesirable consequences by destabilising the macroeconomy of a financially developed remittance-receiving economy, where remittances act as substitutes rather than complements of credit allocation by the financial sector. Evidence for this has been found in some studies including Giuliano and Ruiz-Arranz (2009) for 100 developing countries and Fayissa and Nsiah (2008) for 37 African countries even though the results obtained by Ramirez and Sharma (2008) for 23 Latin America and Caribbean (LAC) countries contradict this argument.

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[8] Even when remittances are spent on imported goods and leisure, the receipt of remittances can expand the tax net in labour, enabling governments these labour-exporting countries to mobilise more resources for redistribution especially through provision of critical social infrastructure that can crowd-in the private sector to boost growth.

[9] A rational migrant will not continue to remit without expecting a positive impact of remittances on the lives of the recipients since the continuous flow of remittances, whether, altruistic or self-interest, are based on mutual trust that guarantees the interest and satisfaction of both parties through strong social ties. No rational migrant who derives utility from remitting will continue to remit large funds home when social ties between him/her family back home has become weak or the trust and confidence the remitter has in the recipient has diminished.

Lipton (1980), Taylor (1984), Rubenstein (1992), and Ahlburg, (1991) contend that international migration drains developing countries of highly trained and skilled labour and capital by crowding-out domestic production of tradable goods in the brain-drained underdeveloped economy. Thus, migrant remittances, apart from deepening foreign-dependency mentality of developing countries[10], they can also cause higher inequality among households and macroeconomic instability in the form of inflation through excess demand for consumables relative deficit in domestic production capacity of developing countries (Adenutsi, 2011). As a follow-up to this earlier contribution, Barajas *et al.* (2009) re-emphasise the remittances-growth nexus through labour force participation in economic activities in remittance-recipient countries where remittances may act as substitutes for wages earned from being engaged in economic activities, through the moral hazard problem (Chami *et al.* 2005; 2008). According to Chami *et al.* (2006; 2008), there is a high possibility of this moral hazards problem occurring because migrants remit under asymmetric information having been separated from their family by distance, and with limited chances of monitoring and enforcing compliance of how remittances should be used. Therefore, recipients of remittances can divert these funds to spending on leisure and unproductive activities, thereby reducing labour participation in remittance-recipient countries in the long run. Evidence for this hypothesis was found by Kozel and Alderman (1990), Itzigsohn (1995), and Chami *et al.* (2008). Nevertheless, since social ties and trust underlie the motivation of a migrant to remit, a rational remitter is not likely to continue remitting under lack of reliable information on the uses of remittances because migrant remittances are sent for specific known purposes (Adenutsi and Ahortor, 2008).

According to Rapoport and Docquier (2006) and Barajas *et al.* (2009:7), the effects of remittances on growth through TFP in a remittance-recipient economy is dependent upon a variety of factors as this channel is transmitted through the efficiency of domestic investment as well as through the effects on the size of domestic productive sectors that generate a set of 'dynamic productive externalities'. If remittances are invested rather than spent of consumer goods, then these funds may affect the efficiency of investment in recipient countries based on the informational advantage or disadvantage of the migrant or the person acting on his/her behalf in this capacity (Barajas *et al.*, 2009). According to Barajas *et al.*

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[10] In countries where remittances form a significant proportion of national output, governments may become complacent and less aggressive in implementing pro-growth economic policies by overlying on remittances.

(2009), if the migrant or his/her investor agent does not have adequate financial literacy and relevant investment information than are domestic financial intermediaries, then the altruistic remittances rather than a capital inflow intermediated by domestic financial intermediaries would reduce the efficiency of domestic investment. Again, remittances could reduce capital productivity when the agents of migrants or the direct beneficiary of remittances decide to invest in riskier projects than they would have normally done if these funds were not considered as risk-free transfers.

Furthermore, remittances have the potential of affecting the formal financial system of the recipient economies in financial resource allocation since remittance inflows most often increase the volume of funds that flow through the formal financial system (Aggarwal *et al.* 2006). This can promote financial market development and, hence, higher economic growth through increased economies of scale in financial intermediation (Barajas *et al.* 2009). But substantial inflows of international remittances can also result in equilibrium real exchange rate depreciation, a recipe for Dutch disease infestation which implies less international competitiveness of the export commodities of the remittance-recipient country which can impact negatively on long-run growth in the labour-exporting developing economies.

2.2 Empirical Literature Review
The conclusions from various empirical studies suggest that the direct impact of remittances on long-run economic growth is mixed even though majority of the results favour a positive impact (see Table A3 in the Appendix for details). The obvious controversy in the literature on remittances has been whether or not; remittances do have a direct or an indirect positive impact on long-run economic growth. In various empirical studies, Amuedo-Dorantes and Pozo (2004), Chami *et al.* (2005; 2008), Fajnzylber and López (2007), Jongwanich (2007), Barajas *et al.* (2009) and Edwards (2010) find that remittances do not have a direct positive growth-impact, or as in some cases, directly impair on long-run economic growth. However, the conclusions from many other studies including León-Ledesma and Piracha (2004), Glytsos (2005), Lucas (2005), World Bank (2006), Caldéron *et al.* (2008), Ahortor and Adenutsi (2009), Catrinescu *et al.* (2009), Jayaraman *et al.* (2009), Mundaca (2009), Rao and Hassan (2009) and Ziesemer (2009) show that remittances do have a direct positive impact on long-run growth, except that the direct impact is marginal in most cases. Other

studies that found direct positive impact of remittances on economic growth include Lartey (2010), Singh *et al.* (2010), Abdullaev (2011), Adenutsi (2011), Ahmed at al. (2011) and Fayissa and Nsiah (2011).

One thing appears quite clear from studies that do not find a direct (positive) impact of remittances on economic growth: even where remittances failed to have direct (positive) impact on growth, they do have a significant positive impact on most of the traditional factors in the neoclassical and endogenous growth models. For instance, Faini (2002), IMF (2005), Fajnzylber and López (2007), Jongwanich (2007), Fayissa and Nsiah (2008), Le (2008) and Chami *et al.* (2009) show that even where remittances inhibit growth, they do impact positively on other growth-enhancing factors like investment in physical assets and human capital accumulation, improved institutions, macroeconomic stability, and financial development through higher savings and in making more funds available for credit expansion.

The general conclusion from all the studies on SSA countries that has been reviewed in this study has been that, remittances are a positive determinant of long-run economic growth, but by and large, this positive impact on long-run growth is minimal. Therefore, it has been suggested that, the positive effects of remittances on long-run growth could be strengthened through improved institutional quality, higher human capital accumulation, creation of good investment climate and financial market development towards increased financial inclusion of the unbanked.

From the literature reviewed, remittances can affect economic growth either directly or indirectly through the endowment in the quality of institutions, macroeconomic stability, human capital and physical capital as well as financial sector development. But this is not unique to remittances alone. For instance, when remittances, just like domestic resources, are saved, but these savings are not translated into productive investment, remittances cannot be blamed for undermining growth. In many developing countries where default risks are high, financial institutions try to avoid extending credit to self-employees and informal sector workers. Under such circumstances, even if financial development improves by way higher credit extension to the private sector, but the beneficiaries are mostly formal sector

employees who are not entrepreneurs, financial development cannot reflect a positive impact on economic growth in such economies, because private investment could still be low. Similarly, investment in human capital development is a pro-growth initiative, but the effects of human capital development on long-run growth could only be positive when measures are put in place to employ the educated to perform a skill-related job in the domestic economy.

3.0 SOME STYLISED FACTS ON REMITTANCE INFLOWS IN SSA

One of the underlying reasons why the impact of remittances on economic growth should not be expected consistent across developing economies of the world is that these developing regions have wide differences net inflows of remittances, but given the problems related to data, the implications of remittances are often analysed based on what has been received rather than the net inflows. In Figure 1, it is shown that, notwithstanding the fact that developing economies are net recipients of remittances (see Figure A1), these economies differ widely in terms of the proportion of remittances paid in terms of remittances received.

For example, between 1980 and 2009, the amount of remittances paid by SSA to the rest of the world constitutes as much as 53.36 per cent of the total remittances received by the sub-region compared to only 4.30 percent and 8.16 per cent in the case of South Asia (SAS) and LAC. Over the same three decades, Middle East and North Africa (MNA) paid out to the rest of the world 15.83 per cent of the remittances it received, East Asia and the Pacific (EAP) paid 17.21 per cent, whilst Europe and Central Asia paid out as much as 47.44 per cent of its remittances. Thus, ideally, if country-based data were readily available, it would have been more relevant to use net remittances inflows in analysing the effects of remittances on economic growth. Indeed, in a comparative study between LAC and SSA countries, Ahortor and Adenutsi (2009) show that although remittances have positive effects on economic growth in both regions, the impact is more robust in LAC.

Figure 1: Total Inflows and Outflows of Remittances in Developing Economies (1980-2009)
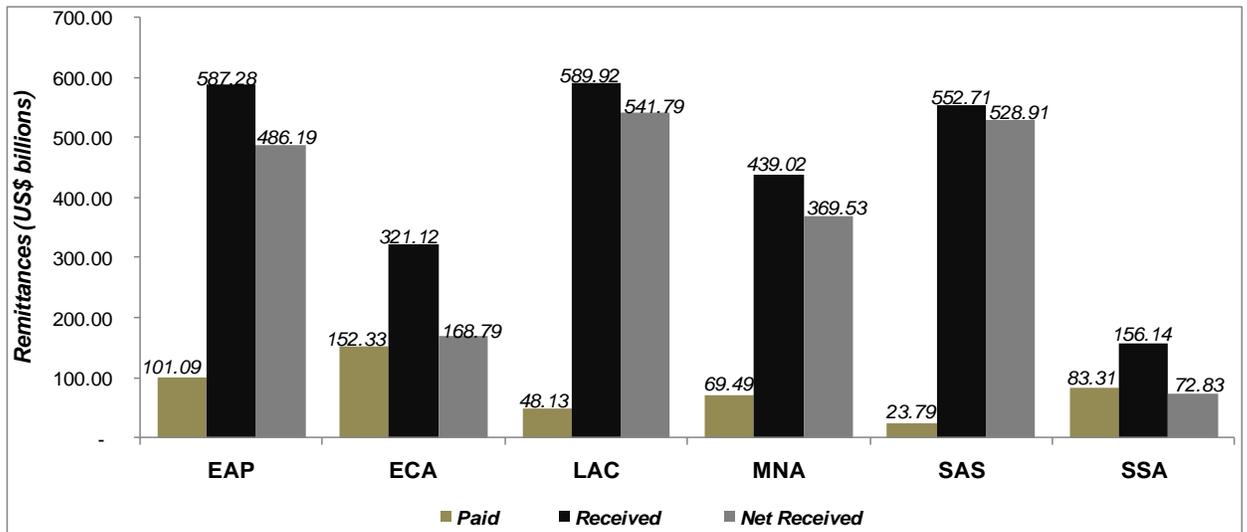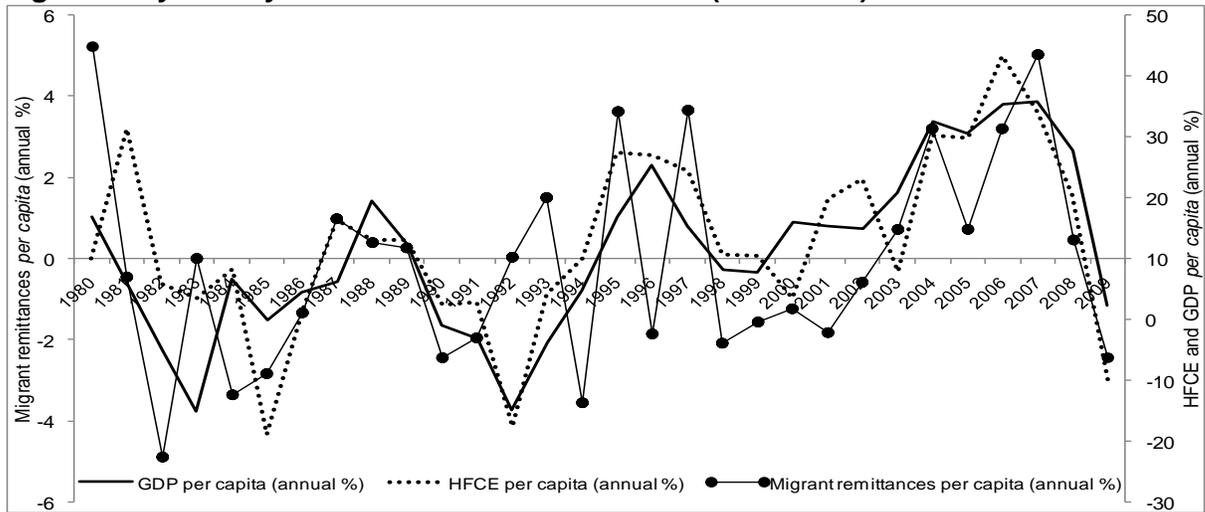
Source: Authors based on WDI (April 2011)

The cyclicality of remittance inflows in SSA is shown in Figure 2, with the evidence pointing to the fact that, remittances were procyclical in the 1980s and the 2000s but countercyclical in the 1990s. The cyclicality on remittance inflows shows the likely use to which remittances might have been put and, hence, the potential changing impact of remittances on growth in SSA over the past three decades. For example, during period when remittances are procyclical, it is mostly likely that self-interest motive might dominate the motives behind remittance inflows, implying a higher likelihood of using remittances to finance income-generating projects, which has a higher positive multiplier in an economy, than when remittances are spent of consumer goods in economies that are import-dependent as is the case for most SSA countries. Chami *et al.* (2005) and Barajas *et al.* (2009) show that when remittances are countercyclical, they are also counterproductive and, hence, cannot have a direct positive impact on growth. In Table A2 in the Appendix, it is shown that, actually, SSA as a sub-region recorded its lowest real *per capita* income and worse general economic decline in the 1990s. The unique cyclicality of remittances brings to the fore the likely endogeneity[11] problems that are associated with estimating growth models involving remittances. Unfortunately, many previous studies failed to account for problem whilst modelling remittances on economic growth and this has obvious negative implications of the results obtained in such previous studies (see Table A3).

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[11] Given the altruistic dominance behind remittance inflows, countries with unfavourable economic conditions and negative external shocks often receive more remittances than those with sound governance and higher growth prospects. See Clarke and Wallsten (2004), Kapur (2004) and Yang (2005) for evidence.

**Figure 2: Cyclicality of Inward Remittances in SSA (1980-2009)**

Source: Authors based on WDI (April 2011)

Inwards remittances have a significant positive correlation with other non-debt capital inflows and core macroeconomic performance indicators such as investment rate and the level of real *per capita* income as shown in Figure 3. Here, it is also shown that it is remittances *per capita* appears a good proxy for remittances per migrant[12] as it is more correlated with investment and general economic performance measured by real GDP *per capita*. This suggests that the conclusions in studies that used remittances as ratio of GDP rather than remittances per migrant could be misleading.

Figure 3:
Correlation between Remittances and Key Macroeconomic Indicators in SSA, 1980-2009

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[12] These authors have shown in earlier works that remittances *per capita* is the best proxy for remittances per migrant and many previous studies that used remittances as a ratio of GDP suffer severely from credibility.
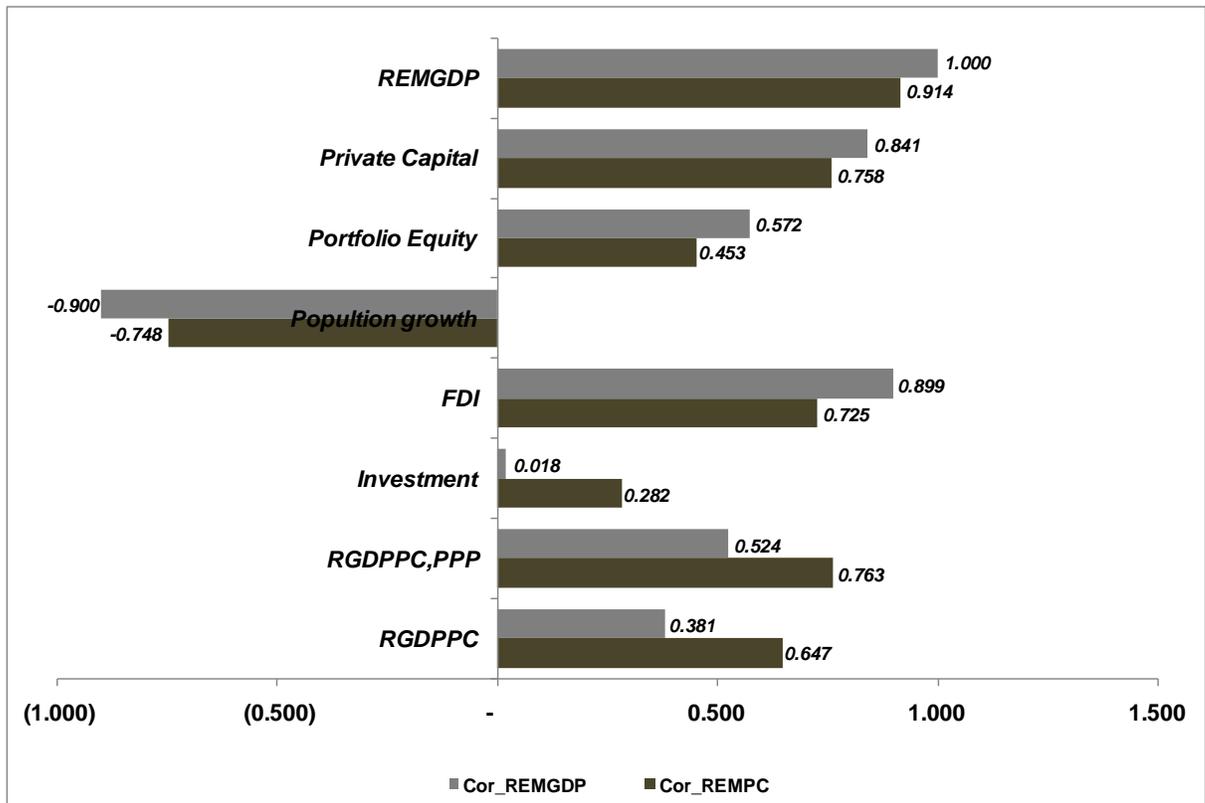
Source: Authors based on WDI (April 2011)

4.0 EMPIRICAL MODEL, METHODOLOGY AND DATA ISSUES

4.1 The Empirical Model and Methodology

From the literature reviewed and stylised facts presented above, it is obvious that remittances are likely to correlate with economic growth and with many traditional determinants of growth in different ways. This is recipe for severe endogeneity problem that poses a challenge in an attempt to analyse the impact of remittances on economic growth using a macroeconometric technique. Among the possible panel-data estimation techniques involving large cross-sections *(N)* and small time period *(T)*, a dynamic model following the Generalised Method of Moments (GMM) procedure is recommended. This study, therefore, used the system GMM procedure suggested by Blundell and Bond (1998) to estimate a empirical dynamic panel-data model, with the dimension *N=36* and *T=10* for decade-based analysis or *T=30* for overall period analysis. The empirical model in its general form is specified as Equation 1.

$$growth_{i,t} \equiv \ln y_{i,t} = \beta_1 \ln y_{i,t-1} + \beta_2 \ln I + \beta_3 \ln H_{i,t} + \beta_4 \ln R_{i,t-\rho} + \beta_5' Z_{i,t} + \mu_t + \phi_i + \varepsilon_{i,t} \qquad (1)$$

where growth*(y)* is the economic growth measured by natural logarithm (ln) of real *per capita* GDP; investment*(I)* measured as the ratio of gross fixed capital formation to GDP; *H* is human capital development measured by secondary school enrolment; and *R* represents remittances per migrant proxied by the sum of *workers' remittances* and *compensation of employees*[13] as a ratio of population. *Z* is a matrix containing the set of principal control variables excluding the lagged dependent variable. The original elements of *Z* are FDI, ODA, trade openness (OPN), bank credit to the private sector (PSC), inflation (INF), government expenditure (GXP), real exchange rate, and institutional quality. Initial growth rate is included so as to capture the convergence phenomenon between economies (Barro and Sala-i-Martin, 1996). The subscripts *i* and *t* are the country and time identities respectively whilst μ_t and ϕ_i are the time-specific and country-fixed effects respectively, whilst ρ is the significant lag operator on remittances, such that $0 \leq \rho \leq 4$. The idiosyncratic disturbance term (ε) which is assumed to be normally distributed with a constant variance and zero mean, takes into account the unobserved time-variant factors that can influence $y_{i,t}$. Equation (1) is a log-semi-log Cobb-Douglas production function expanded in line with the endogenous growth theory. Thus, the empirical model of this study states that economic growth in country *i* at year *t* is determined by initial growth, investment rate, rate of human capital development, current and past rates of remittances and other orthodox factors contained in *Z*. The *a priori* signs of $\beta_1, \beta_2, \beta_3 > 0$, but for the other coefficients, their signs cannot be determined a priori although the sign of the estimated β_4 is skewed towards positive.

The system GMM estimation procedure adopted in this study yields more efficient, precise and reliable estimators than the first-difference GMM proposed by Arellano and Bond (1991) and deviations Arellano and Bover (1995). The merits of the system GMM over the other alternative estimation techniques are well discussed in Blundell and Bond (1998), Behr (2003) and Baltagi (2008).

4.2 Data Sources and Description

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[13] *Workers' remittances* are funds transferred back home by permanent migrants whilst *compensation of employees* are the funds sent home by migrants who are temporarily resident (less than 12 months) abroad.

Unless otherwise specified, the annual panel data used in this study were collated from the April 2011 Edition World Development Indicators (WDI) published by the World Bank and World Economic Outlook published by the International Monetary Fund (IMF). The 36 sampled SSA countries[14] included in the study are those for which balanced data are available on key variables of interest. Economic growth is measured as natural logarithmic value of real GDP *per capita*. In the absence of available data on capital stock, investment in physical capital (I) measured by gross fixed capital formation as a ratio to GDP. Gross fixed capital formation comprises the monetary aggregation of land improvements, plant, machinery and equipment purchases, construction of roads, railways, and other infrastructure like schools, hospitals, offices, private residential dwellings, and commercial and industrial buildings was used. Secondary school enrolment used as a proxy for human capital development (H) was introduced into the model as a key determinant of growth in models such as ours that appeal to endogenous growth doctrine (see Solow, 1956; Romer, 1986, 1990; Lucas, 1988; Barro, 1990, 1991; IMF, 2005; World Bank, 2006; Calderón *et al.* 2008). Openness to international trade (OPN) was proxied by the sum of exports and imports to GDP ratio. Private sector credit (PSC) is the stock of claims by deposit money banks and other financial institutions on the private sector. Central government final consumption expenditure (GXP) as a ratio of GDP was introduced to capture the size of government. Institutional quality was included among the control variables so as to assess the effects of governance on economic growth. This variable was proxied by *polity2 index* (which ranges from -10 for low democratic governance to +10 for high democratic governance and strong institutions) was obtained from Marshall and Jaggers (2011) who construct this index. Real exchange rate was also included in the initial set of control variables. In the final estimation, however, institutional quality and real exchange rate were not included based on the efficiency test of the empirical model. This set of explanatory variables has been the mostly popularly used in empirical growth modelling involving remittances (see Table A3).

5.0 EMPIRICAL RESULTS

The empirical results of this study as presented in Table 1 show that although broadly remittances have a positive long-run impact on growth in SSA, this impact varies overtime in

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[14] The sampled countries are Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Comoros, Congo, Cote d'Ivoire, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo and Uganda.

response to some macroeconomic fundamentals. For example, the 1990s being the worst era of macroeconomic performance stability the sub-region ever recorded, remittances were forced to be countercyclical. And when remittances are countercyclical, their growth impact became statistically insignificant. Indeed, during the 1990s, SSA experienced the most significant decline in real GDP *per capita* growth; domestic savings and investment whilst accumulating the highest external debt ever (see Table A2). In the 1980s and the 2000s when SSA recorded relatively improved macroeconomic stability, remittances were procyclical and, hence, had a significant positive impact on growth.

Table 1: Estimated Results of Impact of Remittances on Growth in SSA (1980-2009)

Group variable: Ccode				Number of obs (overall) = 1027
Time variable: Year				Number of groups (overall) = 36
Two-Step Estimation by Blundell-Bond System Dynamic Panel-Data Procedure				
	1980-89	**1990-99**	**2000-09**	**1980-2009**
Initial economic growth	0.54536	0.86790	0.95904	0.79995
	$(32.44)^{***}$	$(17.22)^{***}$	$(26.19)^{***}$	$(28.28)^{***}$
Investment	0.20561	-0.00517	0.04143	0.02801
	$(12.14)^{***}$	(-0.83)	$(4.92)^{***}$	$(1.74)^{*}$
Human capital accumulation	0.15938	0.03050	-0.00139	0.05047
	$(11.26)^{***}$	$(2.60)^{***}$	(-0.09)	$(4.80)^{***}$
Remittances	**0.02805**	**0.00211**	**0.00579**	**0.00990**
	$\mathbf{(9.38)^{***}}$	**(0.87)**	$\mathbf{(2.03)^{**}}$	$\mathbf{(3.58)^{***}}$
Bank credit to private sector	-0.10751	-0.01736	0.00878	-0.00307
	$(-11.01)^{***}$	$(-3.31)^{***}$	(1.33)	(-0.47)
Foreign direct investment	0.00159	-0.00115	0.00108	0.00163
	(0.53)	$(-3.56)^{***}$	$(3.66)^{***}$	$(4.11)^{***}$
Official development assistance	0.04913	-0.00804	0.00293	0.01804
	$(4.61)^{***}$	$(-2.29)^{**}$	$(2.52)^{**}$	$(7.53)^{***}$
Trade openness	0.06987	0.02471	0.00746	0.04619
	$(3.50)^{***}$	$(2.09)^{**}$	$(1.89)^{*}$	$(5.01)^{***}$
Rate of inflation	-0.00095	0.00016	-0.00051	-0.00026
	$(-5.74)^{***}$	(1.20)	$(-3.45)^{***}$	$(-2.18)^{**}$
Government expenditure	0.05117	-0.02179	-0.01396	0.02026
	$(2.11)^{**}$	$(-1.99)^{**}$	$(-7.85)^{***}$	$(2.04)^{**}$
Constant term	1.70370	0.89044	0.15011	0.89523
	$(18.15)^{***}$	$(2.77)^{***}$	$(1.82)^{*}$	$(5.59)^{***}$
Number of instruments	54	155	255	444
Wald $\chi^2_{,10}$	12279.66^{***}	2454.50^{***}	32078.96^{***}	23323.89^{***}

Arellano-Bond test for zero autocorrelation in first-difference errors (order 2):			
	(0.7373){0.46}	(-1.1079){0.270}	(-0.7989){0.42}	(0.7070){0.48}
Sargan-Hansen test of over-identifying restrictions:			
$\chi^2_{\cdot[\cdot]}$	[43], 25.54	[144], 23.10	[244], 30.86	[433], 31.88

Source*: Author's estimation* ⁄ ⁄ *denote statistical significance at 10%, 5% and 1% respectively*
z-statistics are in ( ), z-probabilities are { }

On the decade-by-decade analysis, even though more remittances were received in *per capita* terms during the 1990s than in the 1980s, it is less likely that these funds were invested in pro-growth projects in the 1990s, a reason for which the impact of remittances on growth was significant and even negative in SSA during the 1990s. When inflation rates are low and other external capital (notably FDI and ODA) became more productive, remittances also engender growth; otherwise remittances somehow behave like FDI and domestic private investment by inhibiting growth at bad economic times. This could be the case in particularly poor import-dependent countries, like it is with many SSA countries, where remittances spent on consumer goods are more likely to cause a leakage rather than an injection into the income flow in remittance-recipient countries.

Another important revelation from this study is that, remittances are more likely to exert a higher positive impact on long-run growth in low-income economies and during difficult economic times when unemployment and liquidity constraint are higher than in richer countries and during good economic times when factor productivity and the propensity to spend on leisure are relatively higher. Countries at the bottom part of the income distribution chart in SSA (say the least 10-25 percent) have more significant positive impact of remittances on long-run growth than their counterparts at higher income levels (say the highest 75-90 percent). Indeed, for countries with higher growth income levels, remittances is actually detrimental to long-run, probably unless such funds are large enough to represent a significant proportion of the average income level of the remittance-recipients. This result is consistent for each of the three decades as well as for the overall study period. The likely reason being that the poor are more likely to value any small 'additional income' in the form of remittances and, hence, more likely to spend these funds more productively than the relatively rich. This conclusion is based on the results of the static simultaneous quantile analysis presented in Table 2. Although the results reported in Table 2 show only the impact of remittances on long-run economic growth, it should be noted that, the estimation involved

all the variables included the final primitive empirical model estimated and reported in Table 1[15].

Table 2: Results of Static Simultaneous Quantile Multiple Regression

1980-1989	10th Quantile	25th Quantile	Median	75th Quantile	90th Quantile	
lnR	0.0819 (3.79)***	0.0219 (0.50)	0.0283 (1.07)	0.0296 (1.15)	-0.0344 (-1.02)	Max. Pseudo R² = 0.53
lnR_1	0.0710 (2.89)***	0.0264 (0.51)	0.0284 (0.71)	0.0407 (1.18)	-0.0485 (-1.46)	Observations = 310
1990-1999	10th Quantile	25th Quantile	Median	75th Quantile	90th Quantile	
lnR	0.1361 (4.40)***	0.1361 (4.38)***	0.0251 (0.07)	-0.0396 (-1.69)*	-1.1301 (-3.27)***	Max. Pseudo R² = 0.62
lnR_1	0.1309 (6.28)***	0.1292 (5.38)**	0.0285 (1.79)*	-0.0522 (-1.86)**	-0.1235 (-4.79)***	Observations = 357
2000-2009	10th Quantile	25th Quantile	Median	75th Quantile	90th Quantile	
lnR	0.0659 (3.46)***	0.0735 (4.82)***	0.0037 (0.10)	-0.0543 (-1.38)	-0.1131 (-2.55)**	Max. Pseudo R² = 0.54
lnR_1	0.0661 (3.47)***	0.0729 (2.97)***	0.0031 (0.08)	-0.0536 (-1.84)*	-0.0929 (-2.16)**	Observations = 360
1980-2009	10th Quantile	25th Quantile	Median	75th Quantile	90th Quantile	
lnR	0.0913 (13.85)***	0.0703 (2.44)***	0.0283 (1.76)*	-0.0054 (-0.21)	-0.0732 (-3.76)***	Max. Pseudo R² = 0.52
lnR_1	0.0944 (11.46)***	0.0795 (4.71)***	0.0300 (2.19)**	0.0091 (-0.61)	-0.0623 (-3.77)***	Observations = 1027

Source: Author's estimation

This finding invalidates the widely held view that remittances are anti-growth in poor countries where the propensity to consume is high. In other words, if remittances are likely to impair growth for reasons of being spent on leisure and imported consumables, this view is only likely to hold in relatively higher income countries or during when an economy is experiencing higher income growth. To a large extent, this finding confirms earlier conclusion drawn by Ziesemer (2009) that remittances promote higher growth in poorer countries.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The impact of remittances on long-run growth is not static but dynamic overtime time in response to the soundness of the macroeconomic environment of remittance-recipient countries. There is no evidence that remittances act as a substitute to financial development or other private capital inflows that are traditionally used to finance development in developing countries. When macroeconomic conditions are favourable (as with lower rates of

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[15] The remittance variable was, however, alternated with its current level and lagged first lagged value in the same set of estimation.

inflation, higher growth rate in investment and income), remittances are more likely to spur long-run growth with greater positive impact on countries with lower growth rates. For remittances to impact positively on long-run growth, they should be received in higher amounts, that the recipients can value, and be motivated to invest than to spend on consumables.

Remittances behave like savings, so although they can enhance growth, they have to be spent on investment goods rather than consumer goods. It is probably for this reason that the one-year lagged value of remittances produced the best positive impact on economic growth. Needless, to say, probably many of the earlier works that do not find a significant impact of remittances on economic growth after controlling for all possible endogeneity in the model and measurement errors, might have lost sight of the possible dynamic effects of remittances. Favourable macroeconomic conditions such as lower rates of inflation, and an ideal investment climate as well as the amount of remittances received in relation to the income of the recipient, are necessary conditions for remittances to engender growth in the long run. The study, therefore, concludes that, during good economic times, remittances are procyclical and, hence, have the potential to spur higher growth in recipient countries; but when remittances are received as compensation for harsh economic conditions then their impact on long-run growth may either be zero and could even be negative, a possible reason for many conflicting empirical results. In this current era, low-income SSA countries with stable macroeconomic environment and good investment climate have greater prospects to harness higher positive impact of remittances on growth provided that can mobilise a significant amount of these funds.

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APPENDIX

Figure A1: Global Outlook of Remittances Received and Paid, 1980-2009
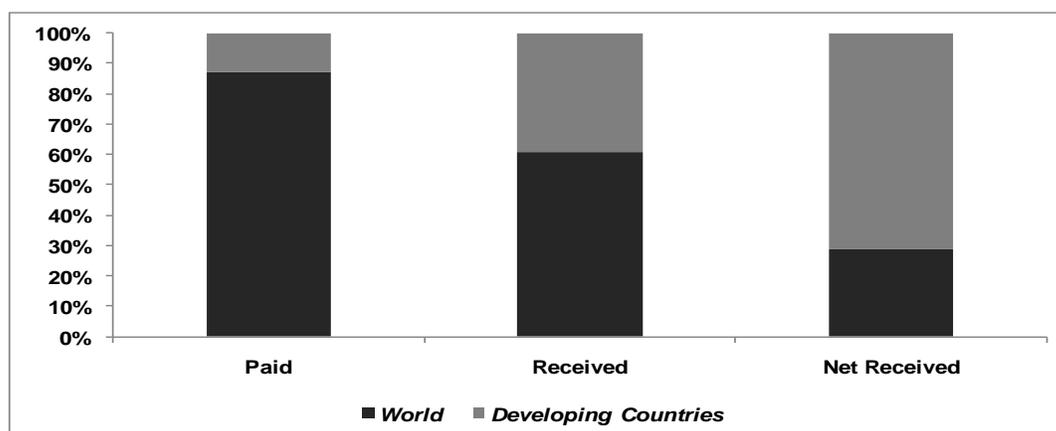
Source: Authors based on WDI

Table A1: Global Remittance Inflows as of 2009

	Remittances	Remittances as a percentage of:			
	(US$ billions)	GDP	Export of Goods	FDI	ODA
World	*416.12*	*0.75*	*3.39*	*35.76*	*326.30*
Developing Economies	*307.65*	*1.88*	*0.08*	*0.86*	*2.42*
East Asia and Pacific	85.79	1.36	4.91	84.58	834.64
Europe and Central Asia	36.02	1.41	5.38	41.81	444.67
Latin America and the Caribbean	56.59	1.43	8.12	73.85	621.62
Middle East and North Africa	33.44	3.22	*n/a*	120.44	246.10
South Asia	75.06	4.45	35.63	195.40	523.72
Sub-Saharan Africa	20.75	2.49	8.03	71.31	46.62

Source: Authors based on WDI

Table A2: Macroeconomic Performance and Policy Environment in SSA, 1960-2009

	Pre-Reforms Era			Reforms	Post-Reforms Era			Overall Period
Key Macroeconomic Indicators	1960-69	1970-79	1960-79	1980-89	1990-99	2000-09	1990-09	1960-2009
GDP (constant 2000 US$ billions)	120.64	190.97	155.81	243.36	293.83	422.66	358.25	254.29
GDP growth (annual %)	4.64	4.07	4.34	2.17	2.02	4.54	3.28	3.46
GDP per capita (constant 2000 US$)	469.57	573.66	521.62	552.17	504.61	558.08	531.35	531.62
GDP per capita growth (annual %)	2.06	1.26	1.64	-0.72	-0.67	1.97	0.65	0.75
External balance (% of GDP)	0.35	-1.51	-0.58	-0.37	-1.43	-1.41	-1.42	-0.87
External debt stocks, total (% of GDP)	-	15.64	15.64	39.72	65.22	39.56	52.39	40.03
Gross fixed capital formation (% of GDP)	-	18.83	18.83	18.33	17.16	16.87	17.02	17.80
Gross domestic savings (% of GDP)	19.40	28.87	24.13	22.23	14.48	23.50	18.99	21.70
Inflation (annual %)	3.06	9.18	6.28	10.68	10.00	7.03	8.51	8.09
Population growth (annual %)	2.53	2.78	2.66	2.91	2.71	2.52	2.62	2.69

Source: Authors computations from WDI (October 2010). **Note**: GGFCE and GFCF denote general government final consumption expenditure and gross fixed capital formation respectively.

Table A3: Summary of Empirical Studies on the Impact of Remittances on Economic Growth

Author(s), Year	Case Study	Study Period	Model & Estimation Method	Variables Included	Key Finding(s)
Chami *et al.* (2003)	113 developing countries	1970-1998	Panel Fixed Effects (FE) and panel Random Effects (RE) instrumental variable modelling	*Dependent*: Annual growth in real GDP *per capita* *Explanatory*: Remittances (WR+CE+MT)/GDP, changes in remittances/GDP ratio. Control variables: Investment (GFCF)/GDP, inflation, net private capital inflows/GDP, regional dummies	Remittances are countercyclical in nature and with a negative impact on economic growth.
IMF (2005)	101 developing countries	1970-2000 (non-overlapping 5-year annual average)	Pooled single equation bivariate model estimated by OLS	*Dependent*: Real GDP *per capita* *Explanatory*: Remittances (WR+CE+MT)/GDP ratio,	Impact of remittances on long-run growth is not statistically significant.
World Bank (2006)	67 developing countries	1991-2005	Unspecified	*Dependent*: Log of real GDP *per capita* *Explanatory*: Log of: initial GDP *per capita*, remittances (WR+CE)/GDP, secondary school enrolment ratio capturing human capital, private sector credit/GDP ratio, political risk, openness, inflation, real exchange rate overvaluation, government consumption/GDP, time dummies	Consistent positive relationship between remittances and economic growth, both when investment was present and absent from the model. But in the absence of investment, the contribution of remittances to economic growth became small.
Acosta *et al.* (2007)	10 LAC countries	Longitudinal survey data (average period: 2000-2004)	Dynamic panel-data model using GMM	*Dependent*: Logarithm of annual growth in *per capita* output *Explanatory*: Log of initial growth rate, remittances (WR+CE+MT) but with some exceptions where two or less components are used. Control variables include average years of secondary school education for male population, and for the female population, price of investment goods relative to that of the USA. All explanatory variables used are of one lag.	Remittances promote long-run growth.
Jongwanich (2007)	17 developing Asia-Pacific countries	1993-2003	Panel Fixed Effects model and system dynamic model	*Dependent*: Annual growth of real GDP *per capita* *Explanatory*: Log of initial real GDP *per capita* growth, log of remittances (WR+CE+MT), human capital development, log of investment (GFCF)/GDP at time t and t-1, log of government consumption/GDP, log of openness, CPI-based inflation.	Remittances have direct negative impact on economic growth, but it impacts positively on growth indirectly through investment in physical assets and human capital accumulation.
Fayissa and Nsiah (2008)	37 Africa countries	1980-2004	Simple log-log linear using dynamic panel-data model following GMM. Robustness FE	*Dependent*: Natural logarithm of GDP *per capita* growth *Explanatory*: Natural logarithm of: remittances (WR+CE) *per capita*, GFCF/GDP, secondary school enrolment, AID/GDP, FDI/GDP, terms of trade, political	Remittances promote growth in countries where financial sector are underdeveloped as it serves as are alternative source of investment finance

			and RE model	rights, initial level of GDP *per capita*	and helping overcome liquidity constraints
Le (2008)	49 selected countries	1970-2005 (5-year period)	Dynamic panel-data model. Single equation OLS with pooled data and Panel Fixed Effects 2-Stage Least Squares (FE2SLS) instrumental variable (IV) models robustness check	*Dependent*: Logarithm of real GDP *per capita* 5-year annual average. Also, average annual 5-year real GDP *per capita* growth *Explanatory*: Initial real GDP *per capita* growth, trade openness measured as exports (X) plus imports (M) as a ratio of GDP, remittances (WR+CE+MT) as a ratio of GDP, quality institutions from polity IV project, and vector of other variables including religious affiliation, and education.	Institutions foster growth but remittances hamper economic growth.
Ramirez and Sharma (2008)	23 Latin American countries	1990-2005	Panel Unit Root and Panel Cointegration test using Fully-Modified OLS approach. *Two main estimations:* With and without financial development	*Dependent*: Changes in logarithm of real GDP *per capita* *Explanatory*: Log of remittances/GDP ratio, and a set of control variables that include fixed capital formation/GDP, openness, labour force, M_2/GDP and domestic credit/GDP.	With financial development, remittances have higher positive impact on growth than without the presence of financial development. In both cases (i.e. with or without financial development), the impact of remittances on upper-middle income group is positive than it is the case of lower income group.
Ziesemer (2008)	50 poor developing countries (i.e. countries with GDP *per capita* less than US$1200 (in 2000 prices)	1960-2003	Dynamic panel data models and system GMM	*Dependent*: 5-year log differences in GDP *per capita* (i.e. $logGDPPC_t - logGDPPC_{t-5}$) *Explanatory*: Log of GDP_{t-5}, literacy rate, ODA/GDP, logGFCF/GDP(-x), log of interest rate, remittances (WR)/GDP, log of labour force, log of world GDP proxied by GDP of the US	Remittances enhance savings, public expenditure on education and growth, but reduce tax revenues and emigration. Taking into account direct and indirect effects of remittances on levels and growth rates of GDP *per capita*, it was found that remittances impact positively on economic growth, investment and literacy rates.
Ahortor and Adenutsi (2009)	31 small-open developing countries from LAC and SSA	1996-2006	Dynamic panel-data model using system GMM	*Dependent*: Natural of real GDP *per capita* *Explanatory*: Initial growth, remittances (WR+CE+MT+ other current transfers)/GDP, investment (GFCF)/GDP, human capital measured as secondary school enrolment, openness (X+M)/GDP, log of CPI as proxy for inflation, government spending/GDP	Generally remittances has positive impact on long-run growth in small-open developing countries, the impact is more robust in LAC than SSA. Contemporaneously, remittances positively affect growth with higher impact in LAC. In dynamic terms, remittances retards growth, but with overall positive impact
Baldé (2009)	29 SSA countries	1980-2004 (3-year	Panel 2SLS IV estimation technique	*Dependent*: Average of 3-year GDP *per capita* *Explanatory*: Natural log of initial GDP *per capita*,	Remittance do not have a direct positive impact on economic growth

		moving average data) Unbalanced panel		remittances (WR+CE+MT)/GDP, ODA/GDP, population growth rate, trade openness (X+M)/GDP, secondary school enrolment for human capital formation, government consumption/GDP, inflation, investment (GFCF)/GDP and political stability	
Barajas *et al.* (2009)	84 developing and emerging countries receiving remittances	1970-2004 (5-year period average)	Pooled OLS IV and FE-IV	*Dependent*: Logarithm of real GDP *per capita* *Explanatory*: Logarithm of: initial growth, remittances (WR)/GDP denoted as REMGDP, $REMGDP^2$, REMGDP*M_2GDP, and average growth rate in top-20 trading partners. Control variables: logarithm of trade/GDP, FDI/GDP, fiscal balance/GDP, population growth rate, and M_2/GDP; political risk	At best, remittances have no effect on economic growth in the long run, probably because poor institutions do not make remittances to be channelled to growth-enhancing projects
Catrinescu *et al.* (2009)	162 developing countries	1970-2003 (unbalanced panel data)	Dynamic panel-data modelling in the context of GMM	*Dependent:* Annual growth in real GDP *per capita* *Explanatory:* Logarithm of: remittances (WR+CE)/GDP with control variables as gross capital formation/GDP, gross domestic savings/GDP, net private capital inflows/GDP, inflation rate and regional dummies	Remittances have a weak impact positive impact on long-run growth, but the positive impact improves in the presence of sound macroeconomic policies and institutions.
Garcia-Fuentes and Kennedy (2009)	14 LAC countries	1975-2000 (overlapping 5-year moving average)	Panel Random Effects (RE) 2SLS with pooled OLS and RE for robustness	*Dependent*: Growth of output per worker *Explanatory:* Human capital stock (HCAP), human capital growth, remittances (WR+CE+MT)/GDP defined as (REMGDP), interaction HCAP*REMGDP interaction, growth rates of HCAP and physical capital plus control variables including time dummies, investment/GDP, government consumption/GDP, and inflation	Remittances positively impact on human capital development and economic growth. Also, there is significant positive effect of the interaction between human capital and economic growth. Thus the impact of remittances on growth is dependent upon the level of human capital development
Giuliano and Ruiz-Arranz (2009)	100 developing countries	1975-2002 (5-year annual average data)	System GMM with Pooled OLS and FE models for robustness test	*Dependent*: Growth in real *per capita* GDP *Explanatory*: Initial growth rate, remittances (WR+CE+MT)/GDP ratio defined as (REMGDP), financial development proxied by M_2/GDP, domestic credit/GDP), bank deposits/GDP, and bank loans/GDP. Control variables include trade openness, human capital growth rate denoted by secondary school enrolment, government fiscal balance/GDP, investment/GDP rate, inflation, and population growth rate	Remittances impact positively on long-run growth in countries with less developed financial systems by serving as an alternative finance of investment and entrepreneurial and entrepreneurial activities to overcome credit constraints. In the absence of financial development, remittances alone do not have a positive impact on economic growth. Remittances have a positive impact on growth at both the median and the mean level of financial development, but their impact becomes zero and eventually turns negative in countries with less developed financial systems above the 75th

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					percentile of the sample distribution
Jayaraman *et al.* (2009)	Samoa	1981-2008	Single equation Autoregressive Distributed Lag (ARDL) bounds testing model	*Dependent*: Log of real GDP *Explanatory*: Log of remittances (WR+CE+MT)/GDP, log of private sector credit/GDP, log of exports/GDP	Remittances have a direct significant positive impact on economic growth
Karagöz (2009)	Turkey	1970-2005	Single equation double logarithmic model using OLS estimation procedure	*Dependent*: Log of GDP *per capita* *Explanatory*: Log of: initial GDP *per capita*, remittances (all private transfers implying WR+CE+MT+ other current transfers)/GDP, FDI/GDP, exports/GDP	Remittances impact negatively on economic growth whilst exports and domestic investment are positive determinants of economic growth.
Mundaca (2009)	25 LAC countries.	1970-2002	Dynamic panel data following first-difference GMM. Full sample as estimated alongside three sub-samples categorised as: (i) large recipients relative to GDP; (ii) low, lower middle & upper middle income but with large receipts of remittances but poorest; and (iii) Central American countries.	*Dependent*: Annual growth of output (GDP) *per capita* *Explanatory*: Log of investment (GFCF) *per capita*, remittances measured as WR to GDP ratio at time t-1, indicators of financial development at time t-1 (here main emphasis is on bank private sector credit (PSC)/GDP. Human capital development is as literacy rate among adults aged 15 years and above. Initial estimation involved on three explanatory variables: investment, initial growth and remittances.	The long-run impact of remittances on economic growth is positive and significant in all four groups (full sample, and three sub-samples) analysed. Expansion of financial services to citizens of remittance recipient countries should lead to better use of remittances and boost long-run growth.
Rao and Hassan (2009)	40 highest remittance-recipients as of 2007 of which 9 are from SSA[16]	1970-2006 (unbalanced panel)	Dynamic panel-data modelling following system GMM	*Dependent*: Growth of GDP per worker proxied by GDP divided by labour force *Explanatory*: Financial development proxied by M_2/GDP, PSC/GDP), government expenditure/GDP, investment/GDP rate, remittance (WR+CE+MT)/GDP, inflation (GDP deflator), REER, and human capital	Remittances have positive growth effects although the impact is small.
Ziesemer (2009)	96 countries that received remittances of at least US$1 in 2003	1960-2003	Dynamic panel-data model using GMM	*Dependent*: 5-year log differences in GDP *per capita* (i.e. $\log GDPPC_t - \log GDPPC_{t-5}$) *Explanatory*: Log of GDP_{t-5}, lagged dependent variables, literacy rate (-5), logGFCF/GDP, logGFCF/GDP(-5), remittances (WR)/GDP, log of labour force	Poorer countries (those with less than US$1200 (2000) GDP *per capita* have greater positive impact of remittances on long-run growth. Savings react much more strongly than investment, with remittances reducing amounts of debts

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[16] These SSA countries are Ethiopia (2%), Kenya (5.4%), Mali (3.3%), Mauritius (2.9%), Mozambique (1.3%), Nigeria (6.7%), Rwanda (1.9%), Senegal (8.5%), Sierra Leone (9.4%), and Uganda (7.2%). Figures in brackets are the remittances ratio to GDP in each sampled country in 2007 cited by authors. Conspicuously missing from the list of SSA countries are traditionally well-known largest remittance-recipients like Lesotho, Cape Verde, and Sudan.

					incurred and debt service paid.
Edwards, (2010)	22 LAC countries	1979-2008	Panel FE modelling	*Dependent:* Natural log of real GDP *per capita* *Explanatory:* Remittances (WR+CE+MT)/GDP, ODA/GDP, GFCF/GDP, openness, secondary school enrolment, life expectancy at birth, CPI-based inflation, government debt/GDP	Remittances have a negative impact on economic growth.
Fayissa and Nsiah (2010)	18 Latin American countries	1980-2005 (unbalanced panel data)	Dynamic panel-data model using first-difference one-step GMM. Pooled OLS, FE and RE for robustness	*Dependent:* Natural logarithm of real GDP *per capita* *Explanatory:* Natural of: remittances (WR+CE) *per capita*, tertiary school enrolment, GFCF/GDP, FDI/GDP, ODA/GDP, other official flows/GDP, trade openness, economic reform index, exchange rate fluctuations	Remittances have significant positive effects on economic growth in Latin America where financial system is less developed.
Kagochi *et al.* (2010)	6 SSA countries	1991-2007	OLS	*Dependent:* Log of real GDP *per capita* *Explanatory:* Logarithm of: Remittance (WR+CE+MT), GFCF *per capita*, population growth rate, human capital (proxied by life expectancy and education)	Remittances are a positive determinant of economic growth in countries where GDP *per capita* is high, but in low GDP *per capita* countries, its effect is zero.
Lartey (2010)	36 SSA countries	1990-2008	Dynamic panel-data models within 2-step system GMM framework	*Dependent:* Annual growth of GDP *per capita* *Explanatory:* Remittance (WR+CE+MT)/GDP, private sector credit/GDP), deposit money bank assets/GDP, government expenditure/GDP, inflation (GDP deflator based), FDI, trade openness, terms of trade, population growth rate (all in logs except GDP growth and inflation)	Remittances have positive impact on economic growth just as the interaction effect of remittances and financial depth
Morton *et al.* (2010)	Largest 20 remittance recipients as of 2008	1980-2008	Descriptive statistics and trend analysis alongside correlation coefficient	*Dependent:* Real GDP *per capita* growth rate. Also, absolute real GDP *per capita* and annual GDP growth *Explanatory:* Remittances (WR+CE)/GDP ratio, poverty headcount ratio (US$2 per day PPP as percentage of population), income share lowest 20 percent of population, gross domestic savings, final consumption expenditure/GDP, capital formation growth rate, CPI, literacy rate and population growth rate.	Remittances reduced poverty but aggravated income inequality. Traditional factors such as physical capital formation, human capital formation and good governance are found to be crucial determinants of growth.
Siddique *et al.* (2010)	Bangladesh, India and Sri Lanka	1976-2006	Granger-causality under VAR framework	*Dependent:* Annual GDP *per capita* growth *Explanatory:* Remittances (WR+CE+MT) *per capita*	Remittances Granger-cause economic growth in Bangladesh. In Sri Lanka, the causal relation is bi-directional, whereas there exists no causal relationship in the case of India
Singh *et al.* (2010)	36 SSA countries	1990-2008	Double log panel FE and panel FE 2SLS	*Dependent:* Log of real GDP *per capita* *Explanatory:* Log of: Initial growth, remittances (WR+CE+MT)/GDP, M_2/GDP, domestic credit/GDP, population growth, government expenditure/GDP, openness, terms of trade, political risk, real exchange	Remittances have direct positive impact on economic growth, but countries with quality institutions have better potential for harnessing the contribution of remittances to growth

				rate, REMGDP*institutions and REMGDP*financial development	
Abdullaev (2011)	10 selected Asian and former Soviet countries	1995-2009	Dynamic panel-data model following GMM estimation procedure. Pooled OLS, FE and RE for robustness	*Dependent*: Logarithm of real GDP *per capita* *Explanatory*: Logarithm of: initial real GDP *per capita*, secondary school enrolment as a proxy for human capital formation, foreign aid/GDP, trade openness/GDP, GCF/GDP, government final consumption/GDP, real interest rate	Remittances impact positively and significantly on economic growth and human accumulation in all models estimated
Adenutsi (2011)	Ghana	1987(3)-2007(4)	Dynamic equilibrium-correction mechanism model, unrestricted cointegration model and Granger-causality test	*Dependent*: Natural logarithm of real GDP *Explanatory*: Log of initial GDP, secondary school enrolment as proxy for human capital formation, investment (GFCF/GDP), remittances (WR+CE)/GDP, and financial development indicators (M2/GDP and bank credit to private sector as ratio of total bank credit). Control variables include government expenditure/GDP, openness to trade (X+M)/GDP, exchange rate, CPI-based inflation, AID and FDI	Although remittances generally promote economic growth in the short-run and the long-run, its impact is low and lower in the long run. In the short run, there is a stronger lagged impact of remittances on growth. There is no causality between credit to the private sector remittance inflows, but a bi-directional causality exists between remittances and M2/GDP
Ahmed *et al.* (2011)	Pakistan	1976-2009	ARDL modelling by OLS	*Dependent:* Logarithm of real GDP *Explanatory*: Logarithm of: remittances (WR+CE+MT)/GDP, M_2/GDP, government expenditure/GDP, dummy for natural calamity (earthquake)	Remittances have both short-run and long-run significant positive impacts on economic growth.
Fayissa and Nsiah (2011)	64 countries from Africa (29), Asia (14) and LAC (21)	1985-2007	Panel Unit-Root tests, cointegration model and Panel Fully-Modified OLS (PFMOLS)	*Dependent*: Log of real GDP *per capita* *Explanatory*: Remittances (WR+CE) *per capita*, economic freedom, capita-labour ratio (GFCF/labour force), economic openness	Remittances have significant positive impact on growth in all three regions as well as in the full sample as a group

Source: Author's compilation from various sources. **Note**: WR, CE, MT denote workers' remittances, compensation of employees and migrants' transfers respectively as defined in Balance of Payments Statistics (BoPS) by the IMF.