The impact of remittances on economic growth in small-open developing economies

Ahortor, Christian R.K. and Adenutsi, Deodat E.

Glisten Strategic Solutions

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[1]C.R.K. Ahortor and [2]D.E. Adenutsi
[1]Glisten Strategic Solutions, P.O. Box MB 658, Accra, Ghana
[2]Department of Economics, Central University College, Accra, Ghana

Abstract: The essence of this study is to verify the macroeconomic implications of cross-border remittances for economic growth prospects of small-open developing economies for the period, 1996-2006. A set of dynamic panel models specified within the framework of Blundell-Bond Generalized Method of Moments (GMM) was empirically analyzed. Using annual panel data from 31 small-open developing countries from Sub-Saharan Africa, Latin America and the Caribbean, this study argues that, contemporaneously, remittances contribute significantly to growth in small-open developing economies. Remittances, however, contribute more to long-run economic growth in Latin America and the Caribbean than to Sub-Saharan Africa. In dynamic terms, remittances retard growth, but with overall positive long-run growth impact across these developing economies. The methodology is very important to apply in another field.

Key words: Remittances, economic growth, panel data, Latin America and Caribbean, Sub-Saharan Africa

INTRODUCTION

The significant contribution of international remittances to the stability and sustainable growth prospects of developing countries can no longer be underrated in the contemporary world. This is because since the past two decades, remittances have not only grown strongly in a positive direction, but these inflows have also exhibited a much more stability than other private capital inflows and Overseas Development Assistance (ODA). In 2005, OECD reported that while Foreign Direct Investment (FDI) and capital flows declined sharply in recent years due to the economic recession in most industrialized countries, workers' remittances continued to increase, reaching US$113.4 billion in 2002, US$142.1 billion in 2003, US$160.4 billion in 2004 and US$167 billion in 2005. These figures clearly suggest that, in recent years, remittances have by far exceeded the volume of ODA. Even in some developing countries today, remittance inflows exceed FDI or export earnings. Between 1995 and 2003, whereas migrant remittances to developing countries grew from US$58 billion to US$160 billion, FDI grow from US$107 billion to just US$166 billion, with ODA increasing from US$59 billion to a mere US$79 billion. In many small-open economies such as Egypt, Gambia, Lesotho, Morocco and Swaziland, migrant remittance inflows alone contribute to more than 5% of gross national income over the past five years.

A striking revelation besides the positive growing trend in global remittance flows to developing countries, which according to the World Bank (2008), migrant remittance in flows alone reached an all-time high of US$282,793 millions in 2008, is the steady manner of reacting to volatile and unexpected economic events. For example, in the wake of the Asian financial crises between 1998 and 2001, when private capital flows declined significantly, remittances to developing countries have continued to rise. It is believed that the consistent positive trend in the flow of remittances can be attributed to some unique features that distinguish remittances from FDI and ODA. The peculiarity of remittance flows is that they are from private sources driven by altruistic and solidarity motives that are expected to remain less volatile than other private official flows and counter-cyclical to smoothen consumption pattern over the business cycle. For instance, it is logical to expect that, under normal circumstances, inward remittances meant for consumption purposes will increase during periods of economic hardships and crisis in low-income countries. Again, when the marginal propensity to invest in a migrant's native country is high, remittances may still increase or, at least, remain less volatile even in the face of economic downturn and adversity compared to other profit-based foreign investment. One other importance of migrant remittance inflows is that it is directed at productive activities (Chami *et al.*, 2005; IMF, 2005). Besides, remittances contribute to poverty reduction and financial development in SSA (Gupta *et al.*, 2007, 2009).

Moreover, Jongwanich (2007) examined the effects of migrant remittances on economic growth and poverty reduction in developing Asia-Pacific countries using

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Corresponding Author: Christian R.K. Ahortor, Glisten Strategic Solutions, P.O. Box MB 658, Accra, Ghana
Tel: +233-24-458 76 43

panel data over the period 1993-2003. The results suggest that even though remittances have a significant impact on poverty reduction by improving incomes, smoothing consumption and easing capital constraints of the poor, they have only a marginal impact on growth operating through domestic investment and human capital development.

Further, using panel unit root and cointegration techniques, Raomirez and Sharma (2008) analysed the impact of remittances on economic growth of selected upper and lower income LAC countries. They found that remittances have a positive and significant effect on growth in the selected countries.

Despite these potential benefits of remittance inflows, it is also argued that the continuous substantial inflows of international remittances could have adverse consequences for an economy through brain drain and supply of active labour force, over-dependency on external economy, inflation, higher voluntary unemployment and exchange rate appreciation. Increasing remittance inflows may also have negative effects on the marginal propensity to save and invest which arises from moral hazards. The implication is that theoretical literature on the impact of remittance inflows on growth is inconclusive suggesting that the impact of remittances on an economy cannot be determined theoretically. One fact, however, is that irrespective of the costs and the benefits associated with remittance inflows, international migration is set to continue, at least, for the next foreseeable years. This is primarily because the ageing population and low population growth rates that have prevailed in the industrialized world since the early 1990s will cause these economies to suffer from labour deficiency, whilst the youthful population and high population growth rates in developing countries will continue to cause excess supply of labour or unemployment in these developing economies. Besides, given the low level of technological advancement and capital base of developing countries, there is currently no sight in mind when industrial wages of developing would rise substantially to equivalence wage levels of industrialized countries to entice their energetic professionals to be discouraged from job-seeking migration to the industrialized countries.

If the foregoing theoretical exposition on international migration and remittance inflows to developing countries is anything to go by, then the potential impact of these remittances on the performance of an economy and long-run growth could be enormous in a small-open developing economy. In effect, the impact of remittances on an economy can only be explored empirically under specific contexts. Accordingly, this study is motivated to examine the implications of remittance inflows for economic growth in small-open economies of Sub-Saharan Africa, Latin America and the Caribbean.

MATERIALS AND METHODS

Trends in remittance flows to developing countries: Generally, remittance flows to developing economies have been increasing substantially since the past two decades in particular. Until very recently, Latin America and the Caribbean (LAC) sub-region was the clear all-time leading recipient of migrant remittances whilst Sub-Saharan Africa (SSA) was the least recipient (Table 1). With the emergence of the Chinese-led economic breakthrough in Asia in recent years, however, the East Asia and Pacific (EAP) sub-region has marginally overtaken LAC countries in 2008 in receipt of international remittances. Even though LAC fell to the second spot in 2008, it is still a major recipient of remittances, taking over 30% of total remittance flows to developing regions. Middle East and North Africa sub-region and Sub-Saharan Africa lag behind the EAP and LAC sub-regions, with Sub-Saharan Africa (SSA) being the very all-time least recipient. In fact, there are considerable variations in remittance inflows across the various sub-regions in the world.

Over the years, the officially reported flows of remittances to Africa have increased from US$5.9 billion in 1980 to US$14.9 billion in 2003 suggesting that the entire African continent receives just about 15 percent of global remittance flows. Sub-Saharan Africa receives just about one-third of the total remittance flows to Africa or 5% of the global remittance flows to developing countries.

Relationship between remittances and economic growth: The long-run motivation for attracting increased remittance inflows is to promote economic growth and development in recipient countries. In line with this ambition, understanding of the appropriate channels through which remittances influence economic performance is essential to formulating sound policies to maximize their overall impact on an economy. The major potential channels of the positive effects of remittance inflows on the growth and development prospects of developing economies include how these remittances impact on domestic investment, balance of payments, ease domestic credit constraints, exports, diversification of economic activities, levels of employment and wages, human capital development and technological progress. On the contrary, remittance inflows may also have adverse effects on the growth and development prospects of developing economies in a number of ways.

Table 1: Migrant remittance in flows to developing countries (1980-2008) [in US$ million]

	Year								
	1980	1985	1990	1995	2000	2005	2006	2007	2008
All developing countries	18,384	19,565	31,058	57,302	84,186	94,174	228,801	264,896	282,793
East Asia and Pacific	1,663	2,133	3,263	9,700	16,682	46,586	52,841	57,988	62,307
Europe and Central Asia	2,071	1,714	3,246	7,750	12,784	31,660	38,830	50,804	53,530
Latin America and Caribbean	1,915	2,603	5,722	13,335	19,987	48,716	57,384	61,000	61,095
Middle-East and North Africa	6,043	6,141	11,393	13,319	12,898	24,150	26,656	32,075	34,500
South Asia	5,296	5,801	5,572	10,005	17,212	33,092	39,615	43,824	50,942
Sub-Saharan Africa	1,396	1,173	1,862	3,193	4,623	9,969	13,475	19,204	20,418

Source: Authors' compilation based on data obtained from the World Bank

One of the critical negative effects of increased remittance inflows on a developing economy is the infection of the Dutch Disease through reduction in international competitiveness. A continuous and significant inflow of remittances can lead to increase in demand for the domestic currency. This increase in demand for non-tradables may further lead to the appreciation of the domestic currency, hence real appreciation of the exchange rate, which in turn reduces the international competitiveness of the country's exports whilst imports are made relatively cheaper. In effect, remittances may, through a number of mechanisms, exacerbate the balance of payments position in the long-run. Lipton (1980), Ahlburg (1991) and Brown and Ahlburg (1999) have argued that remittances undermine productivity and growth in low-income countries because they are readily spent on consumption likely to be dominated by foreign goods than on productive investments.

Theoretically, the degree of impact of remittance inflows on external competitiveness of a receiving-developing country may vary depending upon some specific characteristics. For instance, because unemployment is high in many developing countries, there may not be any significant increase in the production costs of export commodities even in the face of an increased demand for non-tradables. Besides, the composition of the imports is important in this regard. If the increased imports are largely concentrated on capital goods, the pressure on the exchange rate will be minimized and this may even lead to increased production in the long-run. Consequently, the extent to which real currency appreciation of any particular developing country will impact on the growth potentials of that economy depends on the production structure as well as on productivity growth (McKinley, 2005; Heller, 2005). Further, the channel through which remittances influence an economy is also of significant importance.

Empirically, the impact of remittances on economic growth in developing economies has remained inconclusive. IMF (2005) and Chami *et al.* (2005) found that remittances have, respectively, a positive, non-significant and negative impact on economic growth. Just like IMF (2005), Giuliano and Ruiz-Arranz (2005) found that the impact of remittances on growth is not significant in general but it is positive in countries with shallower financial markets. In the case of Latin America, Solimano (2003) find that remittances have positive and significant impact on growth in SSA, but the relationship is not significant for Ecuador. Mishra (2005) and Mundaca (2005), on the other hand, find a positive impact of remittances on growth for a sampled of Caribbean and Latin American countries.

The Albanian economy in the 1990s benefited largely from international remittance inflows which protected the economy from its collapse in 1992. The rapid growth recorded between 1993 and 1996 was outstanding by East European standards and represented the highest rate of sustained economic growth of all transition economies. The main finding by Martin *et al.* (2002) suggests that the success of the Albanian economy in the mid-1990s was due to significant inflow of remittances from Albanians working abroad.

Taylor (1992), Brown (1994), Adams (1998), Massey and Parrado (1998), Kule *et al.* (2002), Mesnard (2004), Zarate-Hoyos (2004) and Woodruff and Zenteno (2007) concluded from their various studies that inward remittances positively impact on household investments in remittance-receiving developing countries.

At the macroeconomic level, the inflows of remittances to developing countries have increased the foreign exchange earnings of labour exporting countries (Ratha, 2003). Ratha (2003) was quite emphatic by concluding that remittances raise the consumption capacity of rural households which might have substantial multiplier effects because they are more likely to be spent on domestically produced goods. World Bank (2008) that migrant remittances impact positively on the balance of payments in many developing countries as well as enhance economic growth, via their direct implications for savings and investment in human and physical capital and, indirect effects through consumption. Hanson and Woodruff (2003) and Edwards and Ureta (2003) found evidence for forward linkages between remittances and human capital formation in Latin America.

On the reverse side, however, studies have concluded that in countries with low GDP (and hence small-open), increased remittance inflows have led to distortions in the functioning of formal capital markets and also destabilize exchange rate systems through the creation of parallel currency markets (Chimhowu *et al.*, 2003). Acosta *et al.* (2007), for instance, found that besides the usual problems associated with nominal exchange rate channel, remittances culminate in the shrinkage of and resource re-distribution away from, the productive sector through increasing prices in the non-tradable sector and reducing the labour supply to and thereby increasing the production costs, of the otherwise labour-intensive non-tradable sector. Conclusions from the works of Capistrano and Sta Maria (2007) suggested that international remittances increase income inequality, especially among rural dwellers. Chami *et al.* (2005) found that remittance inflows have negative impact on growth and productivity of developing countries.

Theoretical and empirical analysis of the impact of remittance inflows on an economy reveals a paradoxical implication. From one perspective, developing countries benefit from international remittance inflows as an additional source of funds to finance economic growth and development programmes. Accordingly, remittance inflows tend to reduce the debts and budget constraints of these small-open economies. From another perspective, continuous and increasing inflows of remittances bring about human capital flight which deprives these small-open economies of a considerable proportion of the very human resource critically required to propel growth and development. However, it is conceivable that given the high level of unemployment and hence surplus labour in developing countries, international migration from developing to industrialized countries should in the long-run, have a positive impact on economic growth if these remittances are actually spent on domestic goods and services as well as on capital goods.

The empirical model and estimation techniques: The econometric approach to this study involves the construction of panels encompassing variables such as real per capita GDP, remittances, investment, human capital development, inflation proxied by the logarithmic form of consumer price index and government expenditure. Annual balanced panel data from 1996 to 2006 involving 31 small-open developing countries of which 16 are from LAC and 15 are from SSA were used. The choice of the study period and sampling of countries from the two sub-regions were dependent entirely on availability of data. The study was conducted in Accra, Ghana, from 5th January 2009 to 26th April 2009.

Dynamic panel models were formulated based on Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998). However, it is noted that if the dependent variable is close to a random walk, Arellano-Bond Approach performs poorly, since past levels convey very little information about future changes, so that untransformed lags become weak instruments for transformed variables (Roodman, 2006). Hence, in view of the bias associated with the quality of instruments in Arellano-Bond Generalised Methods of Moments (GMM) specification, the study employed a system estimator that exploits both the temporal and the cross-sectional variation in the data, following Blundell and Bond (1998).

To empirically explore the responsiveness of economic growth to international remittance inflows, we first specify a simple log-log-linear function which comprises remittances as an explanatory variable of an otherwise orthodox economic growth model of the form:

$$LPKY_{it} = \varphi_0 + \varphi'_1 LPKY_{it-\rho} + \varphi'_2 LREM_{it-\rho} + \varphi'_3 LZ_{it-\rho} + \mu_{it} \qquad (1)$$

where, PKY is the real GDP per capita. REM is a measure of remittances per capita, L is the notation for logarithm, Z represents a set of control variables other than lagged real per capita income ($LPKY_{it-\rho}$) and μ_{it} is an i.i.d. error term. The notations φ'_1, φ'_2 and φ'_3 are row vectors of coefficients of the current and lag values of the respective variables. The a priori expectation is that when estimated φ'_1, $\varphi'_2 > 0$ whereas $\varphi'_3 </> 0$ depending upon the specific variable under consideration.

Our empirical model (Eq. 1) suggests that economic growth (LPKY) depends on previous levels of economic growth ($LPKY_{it-\rho}$), current and past levels of remittances ($LPEM_{it-\rho}$) and current and/or lagged values of the control variables ($LZ_{it-\rho}$). A primary objective of the study is to evaluate the nature and magnitude of the coefficient estimates, especially those of LREM in model 1 for small-open economies in SSA and LAC separately on regional basis at the first stage. At stage two, we estimated this same model for all the SSA and LAC countries together. This is important to allow for some element of heterogeneity where we tested for any variations in the impact of remittances on economic development in SSA as against LAC. Accordingly, empirical model 2 is specified as follows:

$$LPKY_{it} = \varphi_0 + \varphi'_1 LPKY_{it-\rho} + \varphi'_2 LREM_{it-\rho} + \varphi'_3 LREM_{it-\rho}(DUM)_i + \varphi'_4 LZ_{it-\rho} + \mu_{it} \qquad (2)$$

where, DUM is a dummy variable that takes the value of zero if the country in question is a SSA country otherwise

1 for LAC countries. In this regard, the impact of remittances on economic growth for LAC would be given by the sum of φ'_2 and φ'_3.

The control variables included in Z consist of a wide array of potential explanatory variables that can be used in this framework. Our approach to this study is that instead of including many variables to the already bulky variety of pro-growth and development models, we opt for considering a set of variables that has been widely used and acknowledged in a number of empirical growth models. In this context, the works of Barro (1996), Forbes (2000), Banerjee and Duflo (2003) and Knowles (2005) are of extreme relevance. Thus, based on the empirical works of Barro (1996) and Guiliano and Ruiz-Arranz (2005), these variables include the secondary school enrolment used as a measure of investment in human capital (HCA), gross fixed capital formation as a percentage of real GDP which is used as a proxy for investment (INV), inflation proxied by the natural growth in Consumer Price Index (CPI), government spending (GXP) and economic openness (EOP) which is proxied by the ratio of total exports and imports to GDP. Trend (LTREND) was used as an instrumental variable in the empirical model to capture the overall impact of ongoing integration of the LAC and SSA countries into the global economy as well as technical and financial innovations over the last two decades. Essentially, the selection of the regressors is informed by theoretical and empirical consistency and possibility of comparing findings. Equations 1 and 2 have been generalized enough to capture all the dynamics of the growth relationships. This is consistent with the general-to-specific modelling techniques. The models were taken through a reduction process to achieve parsimony.

We followed the estimation procedure of Blundell-Bond (1998) Generalized Method of Moments (GMM) to evaluate the coefficients of the variables as well as the joint effects of international remittances and other explanatory variables on economic growth in SSA and LAC. The estimation was done with the necessary precaution by controlling the system variables to avoid any potential bias emerging from endogeneity of some of the explanatory variables including the lagged dependent variable. The Blundell-Bond system GMM estimation technique is preferred to the difference GMM following Arellano-Bond (1991) and deviation GMM after Arellano-Bover (1995) since in system GMM, one can include time-invariant regressors which tend to disappear in difference GMM (Roodman, 2006). Further, the system GMM allows for more instruments and thus, makes the coefficient estimates more efficient and consistent. We tested for the joint validity of the instruments using the Sargan-Hansen test for over-identifying restrictions. This test was performed after the two-step GMM estimation (Bond, 2002; Roodman, 2006). We further employed the Arellano-Bond test to detect autocorrelation in the idiosyncratic disturbance term, a situation that may render some lags invalid as instruments. The model estimation and all the aforementioned relevant tests were done using STATA version 10.

Data description and sources: The variable that imposes the greatest challenge in terms of definition and measurement is remittances. In many empirical studies, experts compute remittances as the sum of compensation of employees, workers' remittances and migrants' transfers. A good number of researchers also compute remittances simply as the sum of compensation of employees and workers' transfers, or the total of migrant transfers plus an additional category in the Balance of Payments Statistics (BoPS) namely other current transfers from other sectors (OECD, 2005: 14). In this study, we compute remittances as the sum of all the four components viz. compensation of employees, workers'

Table 2: Definition, measurement, sources and expected signs

Variable	Definition, Measurement and Sources	A priori sign
Initial economic growth ($LPKY_{it-p}$)	Lagged economic growth proxied by natural logarithmic form of real per capita income. It was computed as real Gross Domestic Product (GDP) in US$ as a ratio of total population. Source: Computed from International Financial Statistics (IFS).	Positive (+)
Remittances (REM)	International Remittances computed as the sum of compensation of employees, workers' remittances, migrants' transfers and other current transfers in US$ as a share of GDP in US$. Source: Computed from Balance of Payments Statistics (BoPS).	Indeterminate (+/-)
Investment (INV)	The ratio of gross fixed capital formation to GDP. Source: Computed from IFS.	Positive (+)
Human Capital (HCA)	Human capital development was measured as secondary school enrolment as a percentage of total population. Sources: World Development Indicators for LAC and African Development Bank for SSA.	Positive (+)
Economic openness (EOP)	The sum of exports and imports in US$ to GDP in US$. Source: Computed from IFS.	Indeterminate (+/-)
Consumer Price Index (CPI)	The logarithmic form of CPI was used as a proxy for domestic rate of inflation. Source: IFS.	Indeterminate (+/-)
Government Expenditure (GXP)	Government consumption on final goods and services in US$ as a ratio of GDP in US$. Source: Computed from IFS.	Indeterminate (+/-)

Note: With the exception of PKY which is measured in US$ and CPI which is an index, all the other variables are ratios and hence are not in any unit of measurement

remittances and migrant's transfers plus other current transfers since the first-three components are restricted to migrant remittances, but the focus of this study is to examine the impact of total remittances on economic growth. The study made use of annual panel data involving 31 small-open economies from SSA and LAC spanning from 1986 to 2006. All the variables are ratios and hence are not in any unit of measurement except PKY which is measured in US$ and CPI which is an index. The a priori expectations are that the lag of PKY, INV and HCA will have positive impact on current level of PKY, while the impacts of other explanatory variables are indeterminate (Table 2).

PRESENTATION OF EMPIRICAL RESULTS

Three sets of empirical results are presented here. The first set of results is on the impacts of remittances and other control variables on economic growth in Sub-Saharan Africa. The second set of results deals with the impacts of these same predetermined variables on economic growth in Latin America and the Caribbean. The results showing the impact of remittances and other control variables on economic growth across the two sub-regions are contained in the third set of results.

Results of the economic growth model for SSA countries: From Table 3, the summary statistics indicate that the system dynamic panel of 15 countries has 277 observations with 272 instruments. The Wald Chi-Squared statistic of 3745.64 is statistically significant at one percent level, indicating that all the exogenous variables jointly explained economic growth across the sampled SSA countries over the study period. The Arellano-Bond test for autocorrelation shows that there is zero autocorrelation in the residuals from the two-step procedure estimation reported in Table 3A in the Appendix. The Sargan test for over-identifying restrictions also indicates that the instruments used are valid (Table 3A in the Appendix). Considering the likely bias in the results from the two-step procedure, the one-step robust estimation was carried out.

The Arellano-Bond one-step robust estimates reported in Table 3 indicate that growth dynamics are crucial across the sub-region as an increase of 10 percent in the past level of growth explained about 9.3% of current level of growth. Investment had a significant contemporaneous positive impact on income growth. A 10% increase in investment induced 5.42% increase in income. Remittances had both significant contemporaneous and dynamic impacts on income growth. Contemporaneously, a 10% rise in remittance

inflows caused real per capita income to grow by 0.3% over the period at 2% significance level. 1% increases in remittance inflows over the past two years induced 0.27 and -0.25% growth in income at 10 and 5% levels of significance respectively, implying an overall positive dynamic impact of remittances on growth. At 6% significance level, economic openness had a negative impact on output across the 15 sampled countries of SSA. The coefficient estimate of human capital is significant at one percent level, suggesting that a 10% increase in human capital development induced 0.77 percentage growth in real output. 10% increases in consumer price index and government expenditure induced 0.27% increase and 3.7% decline in output respectively at one percent significance level across the sub-region. Market integration and innovation had significant negative impact on output during the study period across the sub-region.

Results of the economic growth model for LAC countries: From the summary statistics reported in Table 4, the system dynamic panel of 16 countries had 304 observations with 284 instruments. The Wald Chi-Squared statistic of 2453.12, at 1% level, is statistically significant, implying that all the exogenous variables jointly explained economic growth across the LAC countries over the study period. The Arellano-Bond test for autocorrelation indicates zero autocorrelation in the residuals from the two-step estimation presented in Table 4A in the Appendix. The Sargan test for over-identifying restrictions also shows that the instruments used are valid (Table 4A in the Appendix). However, the fact that the results of the two-step procedure are likely to be biased prompted the adoption of the one-step robust estimation procedure.

The one-step robust estimates in Table 4 show that output was explained mostly by its own past values. A rise of 10% in the past level of per capita income explained about 6.37% of the current level of real per capita income. An increase in investment by 10% induced 17.8% rise in real output. At one percent level of significance, remittances had 1.8% rise in income in static terms across the LAC sub-region over the study period. Dynamically, a rise of 10% in the previous two years' level of remittances would induce 1.3% decline in real income at 1% significance level. The remaining exogenous variables all had significant impact on income growth at one percent level across the LAC. A 10% rise in human capital development would induce 2.7% increase in income, while a similar percentage increase in consumer price index would cause income to increase by 0.4%. By the same percentage change, economic openness and

Table 3: Empirical results of the economic growth model for SSA countries

LPKY	Blundell-Bond One-Step Robust Estimates					
	Coefficient	SE	z	P>lzl	[95% Conf.	Interval]
LPKY_1	0.927758	0.022050	42.07	0.000	0.884540	0.970975
LINV	0.542175	0.172723	3.14	0.002	0.203645	0.880705
LREM	0.031495	0.013340	2.36	0.018	0.005350	0.057641
LREM_1	0.027399	0.016444	1.67	0.096	-0.049290	0.059630
LREM_2	-0.025250	0.012262	-2.06	0.039	-0.049290	-0.001220
LEOP	-0.130570	0.066890	-1.95	0.051	-0.261670	0.000532
LHCA	0.076811	0.018305	4.20	0.000	0.040933	0.112689
LCPI	0.026990	0.010047	2.69	0.007	0.007298	0.046681
LGXP	-0.370590	0.120669	-3.07	0.002	-0.607090	-0.134080
LTREND	-0.056340	0.016913	-3.33	0.001	-0.089480	-0.023190
CONSTANT	0.032043	0.109383	0.29	0.770	-0.182340	0.246430

System dynamic panel estimation. Group Variable: CCODE, Time Variable: Year, No. of Instruments: 272, No. of Observations: 277, No. of Groups: 15, Obs per groups: Min=15, Avg=18.47, Max, =19 and Wald Chi2(10): 3745.64 Prob>Chi2: 0.0000. Instruments for differenced equation: GMM-Type: L(2/.).LPKY L(1/.).L2.LREM, Standard: D.LINV D.LEOP D.LCPI D.LHCA D.LGXP D.LTREND Instruments for level equation: GMM-Type: LD. LPKY L2D . LREM, Standard: _Cons

Table 4: Empirical results of the economic growth model for LAC countries

LPKY	Blundell-Bond One-Step Robust Estimates					
	Coefficient	SE	z	P>lzl	[95% Conf.	Interval]
LPKY_1	0.637418	0.032609	19.55	0	0.573505	0.701331
LINV	1.781809	0.462624	3.85	0	0.875082	2.688536
LREM	0.187134	0.028140	6.65	0	0.131979	0.242288
LREM_1	-0.053650	0.037412	-1.43	0.152	-0.126980	0.019673
LREM_2	-0.127610	0.024950	-5.11	0	-0.176510	-0.078710
LEOP	-1.081330	0.132815	-8.14	0	-1.341640	-0.821010
LHCA	0.268547	0.084039	3.20	0.001	0.103833	0.433261
LCPI	0.037458	0.007339	5.10	0	0.023075	0.051841
LGXP	-2.566010	0.625713	-4.10	0	-3.792390	-1.339640
LTREND	0.104653	0.040289	2.60	0.009	0.025688	0.183618
CONSTANT	1.729222	0.283045	6.11	0	1.174465	2.283980

System dynamic panel estimation. No. of Observations: 304, Group variable: CCODE, N0. of groups: 16, Time variable: Year Obs per, Groups: Min=19, Avg=19, Max=19, Number of Instruments: 284, Wald Chi2(10): 2453.12 and Prob>Chi^2: 0.0000,Instruments for differenced equation: GMM-Type: L(2/.).LPKY L(1/.).L2.LREM, Standard: D.LINV D.LEOP D.LCPI D.LHCA D.LGXP D.LTREND, Instruments for level equation: GMM-Type: LD . LPKY L2D . LREM, Standard: _Cons

government expenditure would cause per capita income to decline by 10.8 and 25.7 percentage points respectively. A10% advancement in market integration and innovation would induce 1.05% increase in income across LAC countries during the period.

Results of the economic growth model for both LAC and SSA countries: The system dynamic panel for the 31 small-open countries across the two developing regions had 657 observations and 403 instruments. According to the Wald Chi-Squared statistic of 6732.27, all the predetermined variables jointly explained variations in output at one percent significance level across the two regions. The Arellano-Bond test for autocorrelation and the Sargan test for over-identifying restrictions correspondingly indicate first-order autocorrelation in the residuals and validity of the instruments used (Table 5A in the Appendix). The likely bias in the two-step estimation procedure called for one-step robust estimation of the model. The descriptive statistics and the list of countries sampled across the LAC and SSA are respectively reported in Table 1A and 2A in the Appendix.

From the one-step robust estimates presented in Table 5, the coefficient estimates of all the predetermined variables are significant at one percent level except those of the first lag of remittances (LREM) and government expenditure (LGXP) which are significant at 3 and 8% levels respectively. Ten percent increases in the past level of per capita income and investment would induce the current level of per capita income to increase by 6.8 and 1.8% points respectively. Contemporaneously, an increase of 10% in remittances would induce per capita income to increase by 1.3%. Remittances would, however, induce real per capita income growth to decline in dynamic terms with the first and second lags of remittances inducing declines of 0.5 and 0.7% declines in per capita income. Economic openness, government expenditure and integration and innovation index had negative effects, while inflation had a positive impact on per capita income across the two developing regions over the study period. The coefficient estimate of the remittance dummy is positive and significant at one percent level, indicating that the contemporaneous impact of remittances on per capita income in LAC was greater than what pertained across SSA.

Table 5: Empirical results of the economic growth model for developing economies (LAC and SSA)

| LPKY | Blundell-Bond One-Step Robust Estimates | | | | | |
	Coefficient	SE	z	P>lzl	[95% Conf.	Interval]
LPKY_1	0.679965	0.022358	30.41	0	0.636143	0.723786
LINV	0.178065	0.033590	5.30	0	0.112229	0.243901
LREM	0.134645	0.018426	7.31	0	0.098530	0.170760
LREM_1	-0.052770	0.023053	-2.29	0.022	-0.097960	-0.007590
LREM_2	-0.069660	0.016043	-4.34	0	-0.101100	-0.038210
LEOP	-0.195470	0.022970	-8.51	0	-0.240490	-0.150450
LHCA	0.154931	0.032217	4.81	0	0.091787	0.218074
LCPI	0.046982	0.006104	7.70	0	-0.035020	-0.058950
LGXP	-0.048500	0.027525	-1.76	0.078	-0.102450	0.005446
REM(DUM)	0.090361	0.008492	10.64	0	0.073717	0.107004
LTREND	-0.060520	0.019862	-3.05	0.002	-0.099450	-0.215890
CONSTANT	1.253539	0.167312	7.49	0	0.925615	1.581464

System dynamic panel estimation. Group variable: CCODE, Time variable: Year, No. of Instruments: 403, Wald Chi2(11): 6732.27,No. of Observations: 657, No. of groups: 31, Obs per Groups: Min=15, Avg=18.77, Max, =19 and Prob>Chi^2: 0.0000. Instruments for differenced equation: GMM-Type: L(2/.).LGrowth L(1/.).L2.LREM, Standard: D.LHCA D.LEOP D.LCPI D.LGXP D.LINV, D.REMDUM D.LTREND. Instruments for level equation: GMM-Type: LD . LGrowth L2D . LREM,Standard: _Cons. Source: Authors' computations

DISCUSSION

This study was initiated to provide empirical evidence on the long-run significance of international remittance inflows as a source of economic growth in small-open developing economies of Sub-Sahara Africa, Latin America and the Caribbean. From the individual and combined sub-regional regression results presented in the preceding section, remittance inflows had a positive contemporaneous effect on per capita income growth across the Latin America and the Caribbean as well as Sub-Sahara Africa over the period 1986-2006. The impact of international remittance inflows on per capita income growth in dynamic terms across the two sub-regions over the same period was, however, negative. Overall, remittances had a marginal positive impact on income growth across the two developing regions. The results also indicate that, contemporaneously, remittances had a greater positive impact on real per capita income growth in LAC than in SSA. The contemporaneous positive impact of remittances on per capita income growth in the sampled countries over the study period could be explained by the fact that remittances may be used by recipients for consumption and/or investment. All other things remaining equal, whichever use remittances are put, they are capable of inducing an increase in aggregate demand, leading to a rise in national output and a subsequent increase in real income growth. The negative dynamic impact of remittances on real per capita income growth over the study period may be explained by non-regenerating uses of remittance inflows in both LAC and SSA. In other words, very little, if any at all, of the remittances received by these small-open developing economies go directly into financing long-term income-generating activities or pro-growth projects. The variation in the contemporaneous impact of

remittances on economic growth between the two sub-regions may be attributed to the fact that, whereas LAC was the highest recipient of remittances during the period under study, SSA received the least.

These findings have confirmed the popular view upheld by contemporary development economists that international remittance inflows are one of the major macroeconomic factors that significantly promote long-run economic growth in small-open developing economies. The findings of this paper give credence to the ideology of the remittance-optimistic school, by confirming the results of Fayissa and Nsiah (2008) for 37 African countries for the period 1980-2004 that remittances boost economic growth in countries where financial systems are underdeveloped and, hence, incapable of mobilising adequate resources to finance investment projects. Our findings, however, contrast the cross-country empirical works of Chami *et al.* (2005), Giuliano and Ruiz-Arranz (2005) and Acosta *et al.* (2007) who found adverse effects of remittances on economic growth and productivity by re-allocating resources away from key productive sectors.

One possible major reason why the findings of this paper contradicts with the conclusion of many previous works is that, unlike most previous studies, the data and methodology of this paper are unique. For instance, many previous dynamic panel studies on remittances followed the Arellano-Bond (1991) difference GMM estimation procedure, but this study employed a more efficient dynamic panel system GMM framework developed by Blundell and Bond (1998). Again, this study followed a model-reduction process in arriving at the parsimonious empirical model, unlike most previous studies. Thus, in this study only the relevant explanatory variables were included in the empirical model. Apart from these, unlike previous studies which defined remittances narrowly, this

study used the most comprehensive measure of remittances which went beyond only workers' remittances and employees' compensation or migrants' transfers, to include other current transfers.

CONCLUSION

Our empirical findings suggest that the central objective of this paper, which is examining the macroeconomic impact of international remittance inflows on long-run economic growth prospects of small-open developing economies of SSA and LAC has been empirically explored. The paper finds that even though international remittance inflows play a key role in propelling long-run economic growth, the contribution of the traditional neoclassical sources of growth such as investment and human capital development is even more important and should not be ignored by policymakers in designing macroeconomic programmes towards enhancing long-run sustainable growth of small-open economies. In sum, the study has established that:

- Remittances had a positive contemporaneous impact on economic growth in 16 Latin American and Caribbean countries and 15 Sub-Sahara African countries over the period 1986 to 2006
- Contemporaneously, the impact of remittances on economic growth is greater in Latin America and the Caribbean countries than in Sub-Sahara African Countries
- The dynamic impact of remittances on economic growth across the two developing regions is negative
- The overall impact (contemporaneous and dynamic) of remittances across the two regions is positive
- Control variables such as investment and human capital development proxied by secondary school enrolment had significant positive impacts on economic growth in the two regions over the study period
- Control variables such as economic openness and government expenditure had negative impacts on economic growth across the two regions

This study has contributed significantly to existing knowledge by carrying out comparative analysis between LAC and SSA. By this, it explored the differences in impact between the highest and the least recipients of remittances. Thus, the findings are able to highlight the regional differences in remittances impact on economic growth. Further, the findings of this study are unique in that they are able to throw light on both contemporaneous and dynamic impacts of remittances on long-run economic growth.

Given the significant contemporaneous positive contribution of remittance inflows to economic growth as per our empirical findings, the following policy recommendations are advanced for consideration by the finance and monetary authorities in small-open developing economies within the SSA and LAC sub-regions:

- Policymakers should put in place an effective system to attract more remittance inflows into their economies through the formal financial sector. These remittances should be channelled into the productive sectors of the economy and not be expended on non-productive goods
- Policy focus should be directed at encouraging domestic saving and investment from traditional sources to augment remittance inflows so as to boost rapid economic growth of these economies in the long-run
- Specific policy aimed at promoting human capital development through higher secondary school enrolment should be designed in a bid to spur rapid economic growth in the long-run
- Efforts should be directed at improving good governance and minimizing, if not eliminating, corruption as well as wastes and other forms of inefficiencies within the public sector so that the negative effects of excessive government spending on long-run growth would be reduced
- Policies should be designed to give the small-open developing countries in the two sub-continental economic regions a big push for rapid economic take-off since economic growth is mostly propelled by its backlash in these regions

APPENDIX

Table 1A: Summary statistics of variables (based on natural logarithmic values)

Variable	Description	Mean	SD	Min	Max
PKY	Economic Growth	6.754557	1.122160	4.143135	9.208339
REM	International Remittance Inflows	5.718717	1.511621	0	10.06578
INV	Investment	0.169446	0.059078	0.042857	0.574997
HCA	Human Capital Development	3.419074	0.701114	1.252763	4.605170
EOP	Economic Openness	0.370514	0.176953	0.000419	0.906261
CPI	Consumer Price Index as a proxy for Inflation	0.202794	0.512219	-0.10326	4.635217
GXP	Government Expenditure	0.132779	0.055213	0.002423	0.380489

Source: Authors' computations

Table 2A: List of sampled LAC and SSA countries

	Latin America and Caribbean (LAC) countries	Sub-Saharan Africa countries
1	Argentina	Benin
2	Belize	Cape Verde
3	Bolivia	Ethiopia
4	Brazil	Ghana
5	Colombia	Kenya
6	Costa Rica	Mali
7	Dominican Republic	Namibia
8	Ecuador	Niger
9	El Salvador	Nigeria
10	Guatemala	Rwanda
11	Honduras	Senegal
12	Mexico	Sudan
13	Nicaragua	Tanzania
14	Panama	Togo
15	Paraguay	Uganda
16	Peru	

Table 3A: Empirical results of the economic growth model for SSA countries

Blundell-Bond Test Two-Step Panel Estimation Results

LPKY	Coefficient	SE	z	P>lzl	[95% Conf.	Interval]
LPKY_1	0.464110	0.321408	2.01	0.045	0.010559	0.917662
LINV	2.762603	1.313382	2.10	0.035	0.188421	5.336785
LREM	0.227887	0.097643	2.33	0.020	0.036511	0.419263
LREM_1	0.103341	0.092865	1.11	0.266	-0.078670	0.285353
LREM_2	0.119007	0.126207	0.94	0.346	-0.128360	0.366369
LEOP	-2.014090	0.924746	-2.18	0.029	-3.826560	-0.201620
LHCA	0.030879	0.054531	0.57	0.571	-0.076000	0.137759
LCPI	-0.067680	0.170560	-0.40	0.692	-0.401970	0.266614
LGXP	-1.771660	1.630202	-1.09	0.277	-4.966800	1.423474
LTREND	-0.147510	0.213063	-0.69	0.489	-0.565110	0.270085
CONSTANT	1.623670	0.908235	1.79	0.074	-0.156440	3.403778

System dynamic panel estimation. Group Variable: CCODE, Time variable: Year, No. of Instruments: 272, No. of Observations:277, No. of Groups: 15, Obs per groups: Min=15, Avg=18.47, Max=19 and Wald Chi2(10): 520.60 Prob>Chi^2: 0.0000, Instruments for differenced equation: GMM-Type: L(2/.).LPKY L(1/.).L2.LREM, Standard: D.LINV D.LEOP D.LCPI D.LHCA D.LGXP D.LTREND, Instruments for level equation: GMM-Type: LD . LPKY L2D . LREM, Standard: _Cons, Warning: GMM Two-Step Standard Errors are biased Arellano-Bond Test: Order 1: -0.04171 (0.9667), Order 2: 1.0067 (0.3141), Order 3: - (-), Sargan Test: Chi^2 (261) = 7.514792 and Prob>Chi1 = 1.0000 Source: Authors' computations

Table 4A: Empirical results of the economic growth model for LAC countries

Blundell-Bond Test Two-Step Panel Estimates

LPKY	Coefficient	SE	z	P>lzl	[95% Conf.	Interval]
LPKY_1	0.963195	0.125799	7.66	0.000	0.716634	1.209755
LINV	4.896733	2.346242	2.09	0.037	0.298183	9.495284
LREM	0.218212	0.058390	3.74	0.000	0.103770	0.332655
LREM_1	-0.307610	0.127674	-2.41	0.016	-0.557850	-0.057370
LREM_2	-0.100280	0.103302	-0.97	0.332	-0.302750	0.102185
LEOP	-1.782170	0.751065	-2.37	0.018	-3.254230	-0.310110
LHCA	2.290155	1.223213	1.87	0.061	-0.107300	4.687607
LCPI	0.064574	0.015235	4.24	0.000	0.034715	0.094433
LGXP	-23.129000	9.372663	-2.47	0.014	-41.499100	-4.758900
LTREND	-0.375500	0.250174	-1.50	0.133	-0.865750	0.114912
CONSTANT	-3.862640	3.032014	-1.27	0.203	-9.805280	2.079995

System dynamic panel estimation. Group variable: CCODE, Time variable: Year, No. of Instruments: 284,No. of Observations: 304, No. of Groups: 16, Obs per Groups: Min=19, Avg=19, Max=19 and Wald Chi2(10): 1741.37 Prob>Chi^2: 0.0000 Instruments for differenced equation: GMM-Type: L(2/.).LPKY L(1/.).L2.LREM, Order 1: -1.4031 (0.1606),m Standard: D.LINV D.LEOP D.LCPI D.LHCA D.LGXP D.LTREND, Instruments for level equation:GMM-Type: LD . LPKY L2D . LREM, Standard: _Cons, Warning: GMM Two-Step Standard Errors are biased. Arellano-Bond Test: Order 2: 1.5553 (0.1199), Order 3: -0.70798 (0.4790), Sargan Test: Chi^2 (273) = 4.652827, Prob>Chi1 = 1.0000. Source: Authors' computations

Table 5A: Empirical results of the economic growth model for developing economies (LAC and SSA)

Blundell-Bond Test Two-Step Panel Estimates

LPKY	Coefficient	SE	z	P>lzl	[95% Conf.	Interval]
LPKY_1	0.705004	0.038481	18.32	0.000	0.629583	0.780424
LINV	0.158771	0.060024	2.65	0.008	0.041126	0.276415
LREM	0.172114	0.040617	4.24	0.000	0.092505	0.251723
LREM_1	-0.053640	0.024229	-2.21	0.027	-0.101130	-0.006150

Table 5A: Continued

LPKY	Coefficient	SE	z	P>lzl	[95% Conf.	Interval]
LREM_2	-0.088110	0.032553	-2.71.	0.007	-0.151910	-0.024300
LEOP	-0.165840	0.046322	-3.58	0.000	-0.256630	-0.075050
LHCA	0.107969	0.058173	1.86	0.063	-0.006050	0.221987
LCPI	0.050313	0.007647	6.58	0.000	0.035325	0.065302
LGXP	-0.018790	0.051219	-0.37	0.714	-0.119180	-0.081600
LREMDUM	0.058338	0.061280	0.95	0.341	-0.061770	0.178444
LTREND	-0.050640	0.027535	-1.84	0.066	-0.104600	0.003332
CONSTANT	1.255238	0.307302	4.08	0.000	0.652937	1.857539

Blundell-Bond Test Two-Step Panel Estimates

System dynamic panel estimation. Group variable: CCODE, Time variable: Year, No. of Instruments: 403, No. of Observations: 657, No. of groups: 31, Obs per groups: Min=15, Avg=18.77, Max=19, Wald Chi2(11): 5756.25 and Prob>Chi2: 0.0000. Instruments for differenced equation: GMM-Type: L(2/.).LPKY L(1/.).L2.LREM, Standard: D.LINV D.LEOP D.LCPI D.LHCA D.LGXP D.LTREND. Instruments for level equation: GMM-Type: LD . LPKY L2D . LREM, Standard: _Cons, Warning: GMM Two-Step Standard Errors are biased. Arellano-Bond Test: Order 1: -2.1926 (0.0283), Order 2: 0.92904 (0.3529), Order 3: -0.23375 (0.8152), Sargan Test: Chi^2 (391) = 31.4303 and Prob>Chi1 = 1.0000. Source: Authors' computation

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