Remittances, Financial Sector Development, Efficiency, and Growth in Africa

** Raheem Ibrahim Dolapo*

Abstract

The study modelled the relationship between remittances and economic growth and its interaction with financial development and efficiency. Using dataset for 44 countries in Africa for the period from 1998 to 2012, the results obtained showed that remittances are positively related to growth. Remittances impact more in recipients' economies with a less-developed financial sector. Quantity-based indicators of financial development impacted mildly on economic growth as compared to the quality-based indicators. The interaction between remittances and the quality-based indicators was more important to growth than the interaction between remittances and quantity based indicators. These results are robust to the threshold estimation. The study recommended the design of policies that would facilitate improvements in the quality-based indicators, a situation that has previously been ignored.

Keywords: **remittance, financial sector development, indicators, developing countries**

JEL Classification: F22, F43, G21, O40

Paper Submission Date : June 6, 2014 ; Paper sent back for Revision : August 18, 2014 ; Paper Acceptance Date : December 3, 2014

In recent years, the flow of remittances as against other international capital flows (like FDI and ODAs) has increased significantly. This is particularly the case in the developing countries as computation from United Nations Conference on Trade and Development (UNCTAD) database revealed that remittances flow to Africa increased from US$18.9 billion in 1980 to US$83.4 billion in 2000 before reaching US$328.5 billion in 2011. Remittances have become the second largest private capital flows, doubling ODA, and are second only to FDI flows. Also, there is empirical evidence that suggests that remittances are less volatile, counter-cyclical, and have more impact on economic growth than ODA (Driffield & Jones, 2013 ; Yang, 2008).

Apart from the aforementioned benefits of remittances to developing countries, the same have also been linked to helping in addressing poverty and income inequality issues, improvement in education, compensate recipients of negative shock to their income (altruism), and trade & exchange rate (Chami, Fullenkamp, & Jahjah, 2005 ; Portes, 2009 ; Ratha, 2004; Serino & Kim, 2011). In other words, there seems to be consensus on how remittances impact the socioeconomic conditions and welfare (i.e. standard of living of the recipients' households [1]), but their macroeconomic consequences on growth are rather ambiguous as it depends upon the expenditure they finance (either investment or consumption), the activities they stimulate (either work or leisure), and the level of exchange rate and inflation rate remittances produce. Hence, policymakers and academicians have channelled more efforts into understanding remittances and their dynamics.

A new strand in the literature opines that the remittances-growth nexus is contingent upon the level of financial development in the recipient country. Therefore, recipient countries with a well-developed financial system may

* *Student,* Department of Economics, University of Ibadan, Nigeria. E-mail : i_raheem@ymail.com

[1] It is being argued that remittances smoothen the consumption pattern of the recipients' households, since the disposable income is increased. This, however, has a dampening effect on growth in the long-run. This is because most of the developing countries are import dependent. However, if the consumable goods are produced locally, its multiplier effects will enhance economic growth.

witness a greater impact of remittances on their economy than those with nascent financial sectors. According to this school of thought, remittances' impact on financial sector is in the following ways: first, they help to increase the banking population of the recipients' economy, since the population can now have access to banking products and services that initially eluded them. Second, remittances help to solve the problem of credit constraint. This is, however, based on the assumption that part of the remittances are either saved or invested in the financial sector. It is widely acknowledged that the poor economic performance of the developing countries is based on credit limitations, which inhibit the development of entrepreneurial skills. Third, a regular (significant and stable) recipient of remittance can use such flows to secure loans or credit from the financial sectors [2] (Aggarwal, Demirguc-Kunt, & Martinez-Peria, 2006; Bettin & Zazzaro, 2011 ; Giuliano & Ruiz-Arranz, 2009).

Giuliano and Ruiz-Arranz (2009) were among the first to model financial development and its interaction with remittances. In their study of about 100 developing countries, they indicated that remittances work better in a weakly developed financial sector. The interpretation posed is that remittances augment the financial/credit constraint, which in turn provides an alternative source of capital to the recipients . The interpretation to this is that the recipient would take advantage of this situation as a business opportunity and hence invests a certain proportion of the funds in the financial sector. Similarly, since expatriates know more about the economy back home as compared to their currently resident economy, they can remit money to their country to take advantage of the poor financial development. Conversely, is a situation where credit is freely available, then remittances can be sent on consumables and also lead to moral hazards.

In another interesting study, Aggarwal et al. (2006) considered the linkage between remittances and financial development without capturing the impact on economic growth. The study modelled how remittances were positively and significantly important for the financial development of 109 developing countries for the period from 1975-2010. Specifically, they captured how remittances can foster bank deposits and credit. Their results were robust to different estimation techniques and accounted for endogeneity issues aroused by reverse causality, omitted variable bias, and measurement errors.

Other studies that linked financial development to the remittances-growth nexus like Aggrawal et al. (2006) found that migrant remittances lead to financial sector development in the developing economies by leading to an increase in the aggregate volume of deposits and credit intermediated by the banking sector. Orozco and Fedewa (2005) showed that financial institutions' distribution of transfers and financial services provided depended upon the resources of the institution and its existing presence in the community. Gupta, Pattillo, and Wagh (2009) limited their scope to sub Saharan Africa, and found that remittances had a positive effect on both poverty and financial development.

The diverging point between this study and the studies stated above among others is that all the above-mentioned studies captured the size of the financial development, as there is a clear distinction between the size and efficiency of financial development. The latter is a better means to capture financial development (Cooray, 2012). These studies measured financial development by the traditional quantitative based indicators like the ratio of deposits/GDP, private credit/GDP, and liquid assets/GDP, and showed that migrant remittances have a positive influence on financial sector size. Bettin and Zazzaro (2011) opined that the qualitative measure of financial development (efficiency) would be able to capture satisfactorily, the microeconomic efficiency of banks, a fundamental characteristic that the quantitative approach lacks. For example, the traditional indicators lack the ability to select entrepreneur and channel savings towards high profit investment ventures. Hence, this will help ameliorate the negative net present value projects by banks that are accompanied by lower cost (credit) from the banks.

Hence, this study takes a cue from the works of Cooray (2012) and Bettin and Zazzaro (2011) using a dataset for 44 countries in Africa for the period from 1998-2012. The objectives of this study are in three folds: first, to determine the individual effect of remittances and financial development on growth; second, to examine the conditional effect of financial development on the remittances-growth nexus; and lastly and most importantly, to know which of the indicators of financial development matter the most for growth.

[2] It must be noted here that it is not in all cases that this channel works.

Data and Methodological Issues

↳ **Data and Methodological Issues :** The scope of the study is limited to 44 countries in Africa for the period between 1998-2012 [3]. The reason adduced to this can be linked to data availability. All data excluding bank inefficiency index were sourced from World Development Indicator databank (The World Bank, 2012 edition), while the bank inefficiency index was collected from BankScope database (Fitch-IBCA) and from Beck, Demirguc-Kunt, and Levine (1999, updated in 2013).

Unlike other financial flows, remittances are subjected to debatable measurement issues. There is no consensus as regards to the definition and concept of remittance among the policymakers and academicians. Based on the World Bank's definition, it consists of three items: workers' remittance, compensation of non-resident employees, and migrants transfer. The first two items belong to the current account, while the last item is classified into the capital account. It should be noted that the unofficial channels ("hawala" or "hundi"), sending money through friends and family members who are visiting their home country (and money laundering among others) account for a significant proportion of the total money being remitted [4]. Despite this deficiency, better technology, low cost of transfer [5], and efforts to check money laundering might serve as incentives to remit money through the banking sector rather than the unofficial means.

In the present paper, we follow Bettin and Zazzaro's (2011) definition of bank inefficiency, and it is defined as follows:

$$BankInefficiencyit = \sum_{b=1}^{B_j} \left[\frac{operating\ expenses}{(Net\ interest\ revenue + Other\ Income) *} 100 \right]_{bt} W_{it}$$

where,

B_j is the number of banks headquartered in country I and W_{it} is the market share of bank b in terms of total assets. As an alternative measure for bank efficiency, the study made use of (1) ratio of the value of banks' net interest margin to total assets and (2) ratio of banks' overhead costs to real total assets. It is expected that increased competition in the financial market will reduce these measures and as such imply increased efficiency and vice versa (Cooray, 2012). These measures were sourced from Beck et al. (1999, updated in 2013).

Empirically, it is anticipated that the linkage between remittances and growth through the financial sector development might cause endogeneity issues such as reserve causality, omitted variable bias, and measurement error. On the part of reverse causality, a developed financial sector might enhance a lower cost of remitting money, which in turn attracts further inflows. Also, a situation where a significant proportion of the inflow ends up within the financial sector (maybe, as a result of investment by the recipients) would ensure the sector's development. Measurement error might be caused as a result of the unofficial channels (as remittance measurement is a debatable issue both among the policymakers and the academicians). The omitted variable bias might be caused by the evolution of financial development.

In order to address these issues, I included country fixed effect to account for unobserved heterogeneity among

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[3] The selected countries are: Algeria, Angola, Benin, Republic of Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Congo Republic, Cote d' Ivoire, Djibouti, Egypt, Equatorial Guinea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Morocco, Mozambique, Namibia, Niger Republic, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, and Zimbabwe.

[4] Aggarwal et al. (2006) noted that about 50%-250% of the recorded remittance was being accounted for by the unofficial channels; Fassiya and Nsiah (2010) were of the view that about US$186 billion was remitted through the unofficial channels in 2005 ; while, Freund and Spatafora (2005), as cited in Cooray (2012), stated that about 35-75% of the unofficial flow was being accounted for by the official remittances to developing countries.

[5] The average cost of remitting money fell from 8.8% in 2008 to 7.3% in 2011. Specifically, the cost of remitting between Latin America and Spain corridor averages about 5-7% of every $200.

countries' characteristics and potential shifts from informal to formal remittances channels; time effect to control for shocks and trends across countries ; and also accounted for the omitted variables. Also, I employed Arellano and Bover's (1995) system generalized method of moment . The System GMM estimator combines the set of equations in first differences with suitable lagged levels as instruments, with an additional set of equations in levels with suitably lagged first differences as instruments. Blundell and Bond (1998) had evidence from Monte Carlo simulations that System GMM performs better than first-differenced GMM, the latter being seriously biased in small samples when the instruments are weak.

↳ **Model Specification :** Following the studies of Giuliano and Ruiz-Arranz (2009) and Bettin and Zazzaro (2011), I specified a basic growth regression that includes remittances, proxies for financial development, an interactive term between these variables, and a set of other control variables. The equation takes the following form:

$$Y_{it} = \propto_0 + \propto_1 Y_{t,t-1} + \propto_2 REM_{it} + \propto_3 FSD_{it} + \propto_4 [REM * FSD]_{it} + \Sigma^{N}_{j=1} B_j X'_{jit} + \gamma_t + \rho_t + \varepsilon_{it}$$

where,
Y is the growth rate of a country *i* at time *t*, *REM* is the ratio of remittances to GDP, *FSD* is the ratio of proxies for financial development to GDP. I measured financial development/efficiency using five proxies: ratio of liquidity of the financial system *(M2)* as a percentage of GDP; ratio of domestic credit provided by the banking sector [6]; ratio of the value of banks' net interest margin to total assets (interest), ratio of banks' overhead costs to real total assets (overhead). The set of control variables used in this study are population growth (log difference of total population, POP), domestic investment (log of the ratio of gross fixed capital formation and GDP, GFCF), inflation (annual percentage of CPI, INF), government expenditures (general government final expenditure on GDP, GOVC), and trade openness (log of import plus export on GDP, TRA), ρ and γ are country and time fixed effects respectively (refer to the Appendix for the description of the variables).

Analysis and Results

The Table 1 presents the descriptive statistics of the variables in the model. It shows that the median value for Credit Effi, M2 Overhead, and Interest are 18%, 0.283, 4.592%, 4.967, and 5.833 respectively. The Arellano-Bond Test (abond) for autocorrelation shows the absence of second order auto-correlation in the model.

The results obtained from the Table 2 show that remittances in most cases are positively and significantly related to growth. This supports the results of earlier studies, which posited that remittances augment low savings and investment rates in the recipient country (Chamai et al., 2005; Ratha, 2004 ; Portes, 2009 ; Serino & Kim, 2011). However, the results from column 2 prove otherwise ; though, the same were found to be insignificant. As indicated in the columns 3, 4, and 5, it is interesting to note that when the measures of banking sector efficiency (interest, overhead, and effi) were included into the growth regression, remittances have higher coefficients as compared to when the conventional measures of financial development (credit and M2) in columns 1 and 2 were incorporated as additional variables. This supports the findings of Cooray (2012) and Bettin and Zazzaro (2011), who posited that quality based indicators (banking sector efficiency) matter more in the remittances-growth nexus.

As for financial development/efficiency-growth nexus, it could again be reported that growth increases as the measures of financial efficiency increase. This is similar to the results obtained in the remittance-growth nexus. The study also found out that M2 is also positively and insignificantly related to growth, while credit is negatively

[6] I acknowledge the fact that money and capital markets constitute the financial sector. However, due to the nature of the variable of interest (remittance), which is channelled through the banking sector, proxies for financial development using the capital markets were neglected. This practice is consistent with earlier studies.

Table 1. Descriptive Statistics

Variable	Mean	Standard Dev	Median
Credit	32.583	43.198	18.827
GDP	2.163E+10	4.59E+10	5.63E+10
GFCF	24.222	28.732	20.478
GOVC	15.090	6.797	13.740
INF	54.886	10.165	5.833
EFFI	0.939	0.463	0.283
M2	11.016	18.458	4.592
OVERHEAD	5.322	2.930	4.967
POP	2.263	1.014	2.354
REM	4.228	7.939	1.586
TRA	78.800	39.800	70.413
INT	6.503	3.584	5.833

Source: Underlining data from World Bank (2012), Beck et al. (1999 updated in 2012), and Bank Scope

and significantly related to growth. This highlights the liquidity constraint issues facing the financial sectors of the recipients' countries.

One of the key issues of the study, the coefficient of the interactive term between remittances and financial development shows that the marginal effect of the impact of remittances on growth tends to increase as the financial sector efficiency increases. This supports the complementarity hypothesis between remittance and financial sector development and efficiency. This contradicts the results of Cooray (2012) and Bettin and Zazzaro (2011), while it supports the results obtained by Giuliano and Ruiz-Arranz (2009). However, when the proxies of financial development (i.e quantity based indicators; M2 and Credit) interacted with remittance, a mixed result was obtained. Specifically, there is a negative relationship between the interactive term of M2 and remittance and growth. Hence, the issue of complementarity/substitutability cannot be ascertained.

As for the control variables, there is evidence that these reject the convergence hypothesis across all regressions that are also statistically significant across the board. Hence, the chances of the poorer countries catching up with the richer countries are being eroded. The negative and significant coefficient of population growth rate invalidates the total factor hypothesis. It could also be stated that trade openness is very crucial for the growth and developing of the trading countries. The exact effect of government consumption/expenditure is mixed, while inflation can be considered to be a growth drag. It could be summarized that all the control variables in most cases follow the literature intuition.

Furtherance to the results discussed above, the study conducted a simple robustness test. It involves splitting the sample size into two sub-samples using the median values for the proxies of financial development and efficiency (i.e. list of countries with less than or equal to and above the median value). The results are shown in Table 3, and the implication of the results obtained shows that remittances have a greater impact in countries with a low level of financial development and efficiency. This is because the financial sector can be considered to be fragile, and it experiences liquidity/credit constraints, and poor rate of return on investment (among others), and causes poor financial development. Hence, the sector would see remittance as a means of tackling the liquidity problem in the recipient economy.

An exogenous approach to sample splitting is the adoption of the threshold auto regression that was proposed by Hansen (2000). It involves regressing equation 1 with different values for the proxies of financial development. The threshold value is obtained with the value that produces the least sum of square residual and the highest R^2. The conventional classical test such as *t*-statistics is not valid to test for the level of significance. This is due to the reasoning that the TAR technique is non linear. Rather, the level of significance can be determined through the likelihood ratio test (confidence interval). The results of the TAR model, as shown in the Table 4, indicate that the

Table 2. Remittances, Financial Sector Efficiency, and Growth

Variable	1	2	3	4	5
$GDP_{i, t-1}$	1.011 (0.000)***	1.001 (0.000)***	1.013 (0.000)***	1.009 (0.000)	1.034 (0.000)***
REM	0.123 (0.031)**	-0.006 (0.178)	0.201 (0.246)	0.189 (0.078)***	0.245 (0.053)**
M2	0.0163 (0.653)				
CREDIT		-0.154 (0.024)**			
OVERHEAD			0.042 (0.006)***		
INTEREST				0.123 (0.034)**	
EFF					0.453 (0.193)
M2* REM	-0.124 (0.273)				
CREDIT*REM		0.043 (0.064)			
OVERHEAD*REM			0.108 (0.093)*		
INTEREST*REM				0.187 (0.083)*	
EFFI*REM					0.245 (0.194)
GOVC	-0.0003	0.278	-0.004	-0.007	0.301
	(0.557)	(0.092)*	(0.754)	(0.060)	(0.536)
GFCF	0.433	0.039	0.038	0.313	0.153
	(0.3156)	(0.159)	(0.181)	(0.057)*	(0.073)*
POP	-0.006	-0.005	-0.009	-0.008	-0.036
	(0.675)	(0.648)	(0.418)	(0.473)	(0.064)*
TRA	0.245	0.109	-0.003	0.753	0.346
	(0.062)*	(0.062)**	(0.903)	(0.635)	(0.573)
INF	0.046	0.001	-0.136	-0.763	-0.064
	(0.345)	(0.172)	(0.825)	(0.093)*	(0.065)*
CONST	-0.290	-2.258	-0.339	-0.238	-0.174
	(0.001)***	(0.038)**	(0.115)	(0.252)	(0.035)**
R - SQUARED	0.781	0.812	0.963	0.898	0.912
Arrelano-Bond Test for Autocorrelation	0.919	-1.031	1.521	-1.854	1.847
	(0.358)	(0.3072)	(0.173)	(0.166)	(0.684)
WALD CHI^2	2943.3***	585.29***	1525.2***	86.33***	816.84***
Number of Observations	362	363	341	341	354

Source: Underlining data from World Bank (2012), Beck et al. (1999 updated in 2012), and Bank Scope

Table 3. Marginal Impact of Remittance on Growth Below and Above the Median Level of Financial Sector Development and Efficiency

	M2		CREDIT		OVERHEAD		INTEREST		EFFI	
	4.59%	<4.592%	≥18.827%	<18.827%	≥ 4.967	<4.967	≥ 5.833	<5.833	≥ 0.283	<0.283
$GDP_{i,t-1}$	1.019	1.027	1.015	1.022	1.044	1.023	1.027	1.028	1.034	1.024
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000***)	(0.000)***	(0.000)***
REM	**0.097**	**0.113**	**-0.176**	**-0.147**	**0.214**	**0.324**	**0.098**	**0.154**	**0.134**	**0.183**
	(0.087)*	**(0.097)***	**(0.194)**	**(0.408)**	**(0.357)**	**(0.654)**	**(0.861)**	**(0.045)****	**(0.235)**	**(0.093)***
GOVC	0.002	0.008	0.002	0.001	0.003	0.004	-0.004	0.007	0.046	0.048
	(0.220)	(0.856)	(0.337)	(0.574)	(0.119)	(0.874)	(0.810)	(0.432)	(0.025)**	(0.092)*
GFCF	0.01	-0.15	0.037	0.006	0.048	-0.013	-0.007	0.026	0.034	0.084
	(0.783)	(0.742)	(0.169)	(0.823)	(0.240)	(0.091)*	(0.882)	(0.456)	(0.094)*	(0.388)
POP	-0.002	0.035	0.145	0.035	-0.018	0.092	-0.019	0.047	0.038	-0.039
	(0.095)*	(0.454)	(0.477)	(0.103)	(0.313)	(0.309)	(0.261)	(0.195)	(0.203)	(0.058)*
TRA	0.45	0.067	-0.005	0.045	-0.004	0.020	0.032	0.018	0.093	0.038
	(0.084)*	(0.475)	(0.819)	(0.201)	(0.906)	(0.618)	(0.377)	(0.696)	(0.649)	(0.354)
INF	0.001	-0.016	0.001	0.002	-0.003	0.002	-0.003	0.084	0.039	0.094
	(0.708)	(0.305)	(0.339)	(0.240)	(0.036)*	(0.145)	(0.085)*	(0.352)	(0.463)	(0.046)**
CONS	-0.734	-0,791	-0.439	-0.705	-1.271	-0.611	-0.759	0.949	0.848	0.773
	(0.017)**	(0.432)	(0.271)	(0.058)	(0.001)***	(0.241)	(0.042)**	(0.283)	(0.439)	(0.067)*
Number of Observations	170	182	191	211	174	179	175	166	178	191
Arrelano and Bond Test for Autocorr.	-1.038	0.938	0.92	0.632	1.289	1.830	0.938	0.739	0.273	0.038
	(0.283)	(0.338)	(0.342)	(0.357)	(0.937)	(0.358)	(0.736)	(0.252)	(0.183)	(0.638)
Number of Countries	22	22	24	20	21	23	23	21	20	24

Source: Underlining data from World Bank (2012), Beck et al. (1999 updated in 2012), and Bank Scope

Table 4. Threshold Estimates

Variables	Threshold Estimates	Confidence Interval
CREDIT	18.805	12.834
M2	4.601	13.947
INTEREST	5.790	11.975
OVERHEAD	5.001	13.074
EFFI	0.296	11.787

Source: Underlining data from World Bank (2012), Beck et al. (1999 updated in 2012), and Bank Scope

threshold values of the proxies of the financial sector are quite similar to the median value. This further confirms the previous findings that remittances have a greater impact on growth in countries with a less developed financial sector. This is also consistent with Bettin and Zazzaro (2011) on the one hand, and with Liao and Huang (2009) on the other hand (who observed that the threshold effects usually occur in countries with a lower financial development). The results are presented in the Table 4 (for the want of space, only the threshold values for the proxies of the financial sector are presented. However, the full results can be made available upon request from the author).

Concluding Remarks

The study modelled the relationship between remittances and economic growth and their interaction with financial development and efficiency. Using the dataset for 44 countries in Africa for the period between 1998-2012, the results obtained showed that the traditional based indicator of financial development has a relatively mild impact on economic growth as compared to the quality based indicators. Also, the positive impact of remittance on growth was also established, in which the said relationship is complementary in nature. In addition to this, remittances have a greater impact on growth in recipient countries with less developed financial sectors as they ease the credit constraint challenges to finance investments. These results are robust to the threshold analysis employed. The policy implication of the study is to formulate polices that would further improve the level of efficiency of the financial sector on the one hand. On the other hand, the policy makers should design policies aimed at reducing the transaction cost of remittances, as this will further increase the flow of remittances across regions.

Research Implications, Limitations of the Study, and Scope for Further Research

The significance of this study is related to the postulated hypothesis about the significance and importance of quality-based indicators in the remittances-growth nexus. The study was able to show that the quality-based indicators - when they interact with remittances - yield more economic growth as compared to the interaction between quantity-based indicators and remittances. The limitation of the study is its inability to explain why and the channels through which remittances do not have a favourable impact on growth in financially developed recipients' countries. It is important for future studies to unravel this mystery. Also, since the scope of this study is limited to African countries, it would be difficult to generalize the conclusion for other continents. Hence, it is on this note that a recommendation is made for future studies to examine this hypothesis beyond African countries.

References

Aggarwal, R., Demirguc-Kunt, A., & Martinez-Peria, M. S. (2006). *Do workers' remittances promote financial development?* (World Bank Policy Research Working Paper 3957), Washington. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/8418/wps3957.pdf?sequence=1

Arellano, M., & Bover, O. (1995). Another look at the instrumental variables estimation of error - components models. *Journal of Econometrics, 68* (1), 29-51.

Bank Scope Database. Fitch-IBCA. Retrieved from www.bankscope.bvdinfo.com

Beck, T., Demirguc-Kunt, A., & Levine, R. (1999). *A new database on financial development and structure* (World Bank Policy Research Working Paper 2146). Washington : World Bank.

Bettin, G., & Zazzaro, A. (2011). Remittances and financial development: Substitutes or complements in economic growth ? *Bulletin of Economic Growth, 64* (4),509 - 536. DOI: 10.1111/j.1467-8586.2011.00398.x

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87* (1), 115-143.

Chami, R., Fullenkamp, C., & Jahjah, S. (2005). Are immigrant remittance flows a source of capital for development. *International Monetary Fund Staff Papers, 52* (1), 55-81.

Cooray, A. (2012). Migrant remittances, financial sector development and the government ownership of banks: Evidence from a group of Non-OECD economies. *Journal of International Financial Markets, Institutions and Money, 22* (4), 936-957.

Driffield, N., & Jones, C. (2013). Impact of FDI, ODA and migrant remittances on economic growth in developing countries: A systems approach. *European Journal of Development Research, 25*, 173-196. DOI:10.1057/ejdr.2013.1

Fayissa, B., & Nsiah, C. (2010). *Can remittances spur economic growth and development? Evidence from Latin American Countries* (LACs) (Working Paper Series March 2010). Department of Economics & Finance, Middle Tennessee State University, Murfreesboro.

Giuliano P., & Ruiz-Arranz, M. (2009). Remittances, financial development, and growth. *Journal of Development Economics, 90*, 144 - 152.

Gupta, S., Pattillo, C. A., & Wagh, S. (2009). Effect of remittances on poverty and financial development in sub-Saharan Africa. *World Development, 37*(1), 104-115. DOI : http://dx.doi.org/10.1016/j.worlddev.2008.05.007

Hansen, B. E. (2000). Sample splitting and threshold estimation. *Econometrica, 68* (3), 575-603.

Liao H., & Huang, B. (2009). *Does financial openness spur economic growth? A panel regression approach* , pp. 1-28.

Orozco, M., & Fedewa, R. (2005). *Leveraging efforts on remittances and financial intermediation*. Report Commissioned by the Inter-American Development Bank.

Portes, L.S.V. (2009). Remittances, poverty and inequality. *Journal of Economic Development, 34* (1), 127-140.

Ratha, D, (2004). *Workers' remittances: An important and stable source of external development finance*. Global Development Finance 2003 Striving for Stability in Development Finance Chapter. 7 (pp. 157 - 175). Washington DC : World Bank. Retrieved from http://siteresources.worldbank.org/INTRGDF/Resources/GDF2003-Chapter7.pdf

Serino, M.N.V., & Kim, D. (2011). How do international remittances affect poverty in developing countries? A quantile regression analysis. *Journal of Economic Development, 36* (4), 17- 40.

The World Bank. (2012). *World development indicators.* Retrieved from data.worldbank.org/data-catalog/world-development-indicators

Yang, D. (2008). International migration, remittances and household investment: Evidence from Philippine migrants' and exchange rate shocks. *The Economic Journal, 118* (528), 591 - 630.

Appendix

Variable Description

Variable	Description
Economic Growth	Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2005 U.S. dollars. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources
Remittances	Workers' remittances and compensation of employees comprise current transfers by migrant workers and wages and salaries earned by nonresident workers. Data are the sum of three items defined in the fifth edition of the IMF's Balance of Payments Manual: workers' remittances, compensation of employees, and migrants' transfers. Remittances are classified as current private transfers from migrant workers resident in the host country for more than a year, irrespective of their immigration status, to recipients in their country of origin. Migrants' transfers are defined as the net worth of migrants who are expected to remain in the host country for more than one year that is transferred from one country to another at the time of migration. Compensation of employees is the income of migrants who have lived in the host country for less than a year.
Liquidity of the Financial System (M2)	Money and quasi money comprise the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government. This definition of money supply is frequently called M2; it corresponds to lines 34 and 35 in the International Monetary Fund's (IMF) International Financial Statistics (IFS).
Credit provided by the banking system	Domestic credit provided by the banking sector includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The banking sector includes monetary authorities and deposit money banks, as well as other banking institutions where data are available (including institutions that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other banking institutions are savings and mortgage loan institutions and building and loan associations.
Inflation	Inflation, as measured by the consumer price index, reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.
Population Growth	Annual population growth rate. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of the country of origin.
Government Expenditure	General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation.
Trade Openness	Trade in services is the sum of service exports and imports divided by the value of GDP.
Gross Fixed Capital Formation	Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. According to the 1993 SNA, net acquisitions of valuables are also considered capital formation.

Source: World Bank