

Remittances and Economic Growth: Empirical Evidence from Ghana

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Abstract

This study investigated the link between remittances and economic growth in Ghana. The inflow of remittances into Ghana specifically and into Sub-Saharan Africa in general is very insignificant compared to other parts of the developing world. The study used the Granger-causality and Cointegration tests under the Vector Autoregression (VAR) framework. The results showed a unidirectional link between remittances and economic growth in Ghana. They showed that remittances lead to economic growth marginally but economic growth does not lead to remittances. They also established that remittances have been very useful in promoting household welfare and health.

Keywords: Remittances, Economic Growth, Cointegration, Granger-causality

1. Introduction

Theoretically, remittances can spur on economic growth through channels such as facilitating the financial market development, serving as a source of finance for entrepreneurial activities, insurance against shocks, financing household expenditure, financing of household capital formation, bridging savings gap and the external gap of financing. This has been empirically proven by a section of literature which found that remittances inflows lead to economic growth (see; Ramirez, 2013, Lartey, 2011, Pradhan et al., 2008 and Adenutsi, 2011)

On the other hand, remittances can retard economic growth. This can happen if the remittances received are used by recipients to reduce their labour supply to the economy (Chami et al, 2005). When this happens, the recipients who are supposed to be part of the active labour force will automatically become dependent thus relying solely on the migrant for survival. Where remittance inflows lead to so much appreciation of the local currency, it can also harm the economy of the country as it will discourage exportation thus reduce entrepreneurial competition in the recipients country (Lopez et al, 2007).

Given the two strands of literature, the goal of this study is to empirically investigate whether or not remittances lead to economic growth in Ghana and to further determine the direction of the causality link between remittances and economic growth. It will therefore examine whether or not remittances cause economic growth or it is the reverse or there is a two-way causality link. Though a lot of work has been carried out on the remittances and economic growth nexus, most of the studies have focused on whether or not remittances lead to economic growth. Besides, other studies have generally made use of panel data to study developing countries therefore making it very difficult to address country specific issues from such studies(see; Fayissa and Nsiah, 2010, Gupta et al 2009, Feeny et al 2014, Lartey 2011, Driffield and Jones, 2013, Brown and Leeves 2011, Pradhan et al 2008). As far as we know, the only studies close to our study are the works of Adenutsi (2011) and Siddique et al (2011). Adenutsi (2011) examined the causal link between remittances and economic growth but his emphasis is on using financial development as a channel of economic development in Ghana. Siddique et al (2012) investigated the causality link between the variables in the economy of Bangladesh, Sri Lanka and India. Though the methodology is very similar, the countries under study are different in economy and location. Bangladesh, Sri Lanka and India are larger economies and receive remittances far more than Ghana does. Different outcome can therefore be expected from the study. Besides filling this literature gap, the study will give direction to policy makers regarding migration of workforce and the processes involved in receiving remittances. The rest of the work is structured as follows; section 2 is focused on theories of remittances, section 3 will review related empirical literature while section 4 is devoted to the exposition of the data and methodology used for the study. Finally section 5 and 6 respectively look at the empirical results and analysis and the conclusion to the work.

2. Theories of Remittances

Solimano (2003) outlined four major theories that motivate migrants to remit. They include; altruistic theory,

self-interest theory, implicit family contract I (loan repayment) and implicit family contract II (co-insurance).

Altruistic Theory

This theory believes that the migrant feel obligated to remit to his family back home as a result of his love and affection he has for his family members. This could be due to the fact that the migrant has undertaken his journey arising from poverty prevalence back home and hence to smooth the consumption of the family. It is argued that remittances reduce with time if the motive is altruistic (Stalk, 1991).

Self-Interest Theory

This theory believes that the migrant saves at his destination and as part of his plans to accumulate wealth, will remit home for investment projects such as the purchase of land, purchase of property, and invest in stock market or the money market. It is believed that interest rates on such investments will be higher at the home country than the destination and there are people back home to administer these investments.

Implicit family contract I (Loan Repayment) Theory

As noted by Poirine (1997) and Brown (1997), this theory believes that family members of the migrant either sponsored wholly or partially his journey cost of emigration or of his schooling abroad, hence the obligation for the migrant to pay back after some time. The migrant therefore has a contract with the family which he pays when he settles gradually. The amount to remit will however depend on the migrant's financial situation abroad.

Co-insurance Theory

This theory is premised on diversification principles. The belief is that the destination country will have different (superior or relatively improved) economic conditions. Thus, the family sponsors a member to go and settle abroad so that if there are economic down turn in the home country, the migrant will remit home to support the family. On the other hand, the family will also serve as a form of insurance to the migrant in terms of bad times for the migrant.

3. Related Literature

In recent years, flows (remittances) from international migrant to developing countries have attracted the attention of policymakers, researchers and scholars. This rising interest and enquiry into the continuous increasing remittance flows to developing countries has resulted in experts having to express divergent views on its implications for economic growth and development. One school of thought believes that remittances constitute a catalyst for accelerated economic growth and development as they increase the purchasing power of households and also serve as an additional working capital for private enterprises of recipient households who are often resident in low-income countries.

On another hand, international remittance inflows are feared to be capable of destabilizing the macro-economy of developing countries through excess demand resulting in price hikes; weakening international competitiveness of exports due to real appreciation of exchange rate, and promoting moral hazards where labour market participation is reduced due to over-reliance on remittances by beneficiary households while government inducement for implementing sound macroeconomic policies towards stability, growth, structural reforms and poverty reduction might be considerably truncated (Adenutsi,2011).

Saddique et al (2012) investigated the causal link between remittances and economic growth in Bangladesh, India and Sri Lanka, by employing the Granger causality test under a Vector Autoregression (VAR) framework. Using time series data over a 25-year Period, it concluded that growth in remittances does lead to economic growth in Bangladesh. In India, there seemed to be no causal relationship between growth in remittances and economic growth; whilst in Sri Lanka, a bi-directional causality was found; namely economic growth influences growth in remittances and vice-versa.

Similarly, Zue et al (2010) assessed the impact of remittances on the savings behavior of rural households in China, using a primary survey undertaken by the authors in 2006. The study allowed for endogeneity and left-censoring of remittances. It was found out that the marginal propensity to save out of remittances is well below half of that of other sources of incomes. Moreover, there is no evidence of any direct effect of remittances on either capital input or gross output of farm production. These findings are consistent with recent studies which conclude that remittances are largely used for consumption purposes by rural Chinese households.

Brown & Leeves (2011) adopted a unique household survey data from Fiji and Tonga to estimate and compare the combined impact of migration and remittances on the composition of household incomes. A two-step methodological approach was adopted. A migration prediction model and a three Stage Least Squares (3SLS) remittances and income equation system are used. The results indicate that remittances contribute to growth in productive capital and entrepreneurial activity in the longer-established migrant economy, but have yet to impact on business activity in the more recently remittances-oriented economy, despite it having a more developed, market economy. In the latter case, remittances seem more linked to supporting consumption through supplementing low wage income. These findings suggest that the duration and intensity of remittance-driven

migration, and the structure of economic activity within a community are important in understanding the influences of migration and remittances on household resource allocation and production decisions.

Adenutsi (2011) provided further insights into understanding the finance-growth nexus by verifying the hypothesis that financial development promotes economic growth through its capacity to attract increased international migrant remittances to Ghana. A dynamic equilibrium-correction mechanism model approach for the period 1987(3)-2007(4) was estimated following the Johansen co-integration procedure. The approach produced maximum likelihood estimators of the unconstrained cointegrating vector, and suggested the number of cointegrating vectors without relying on an arbitrary normalization. The study revealed two stylized facts on Ghana. First, although financial development Granger-causes international migrant remittance inflows, it is in itself directly detrimental to endogenous growth. Second, international migrant remittance inflows are statistically significant in explaining variations in endogenous growth in the short-run as well as in the long-run.

Lartey (2011) analyzed the relationship between remittances and per capita growth, and investigated whether the impact of remittances on growth is through capital accumulation or other mechanisms. Using data from sub-Saharan African countries and dynamic empirical models, the results indicated a positive relationship between remittances and growth, as well as a positive interaction effect between remittances and financial depth on growth. The findings also reveal threshold values for two main indicators of financial development, above which the total effect of remittances on growth is positive.

Feeny et al (2014) examined the impact of remittances on economic growth in Small Island Developing States (SIDS). Results from variants of an empirical model suggested that while, on average, there is at best no association between remittances and growth in developing countries, there is a positive association between these variables in SIDS. This finding holds for SIDS in sub-Saharan Africa and the Pacific but not for those in Latin America and the Caribbean.

Rao & Takirua (2010) adopted Country specific time-series models of the determinants of output for the small developing island countries in the Pacific region. They explored the applicability of the framework underlying Solow (1956) to analyze the determinants output in Kiribati for the period 1970 to 2005. It showed that technical progress in Kiribati have been negative virtually offsetting the positive effects of factor accumulation. Aid and remittances have negative effects and exports have only a small positive effect in the short-run.

Gupta et al (2009) assessed the effect of the steadily growing remittance flows to sub-Saharan Africa. Though the region receives only a small portion of the total recorded remittances to developing countries, and the volume of aid flows to sub-Saharan Africa swamps remittances, they found that remittances, which are a stable, private transfer, have a direct poverty-mitigating effect, and promote financial development. The findings hold even after factoring in the reverse causality between remittances, poverty, and financial development. Adams, (2010) reviewed 50 recent empirical studies of the economic impact of international remittances on the developing world that are based on household survey data. It begins by reviewing the considerable methodological problems confronting economic work on international remittances, and then examined the strengths and weaknesses of various economic studies of the impact of remittances in the developing world on such outcomes as: poverty and inequality, health and education, investment and savings, labor supply and participation, and economic growth. The findings showed that while international remittances generally have a positive impact on poverty and health in the developing world, remittances can have negative effects on labour supply, education and economic growth.

Despite the increasing importance of remittances in total international capital flows, the relationship between remittances and economic growth has not been adequately studied (Fayissa & Nsiah, 2010). In furtherance to their position, they explored the aggregate impact of remittances on economic growth within the conventional neoclassical growth framework using panel data spanning from 1980 to 2004 for 36 African countries. The results indicated that remittances positively impact economic growth by providing an alternative way to finance investment and helping to overcome liquidity constraints.

4. Data and Methodology

4.1 Data

The data is made up of annual time series data of Remittances (Rem) per capita received, change in Export (EXPg) per capita, change in Import (IMPg) per capita and change in Gross Domestic Product (GDPg) per capita of Ghana. The data ranges from 1980 to 2012. The variables are measured in US dollars and they are extracted from the International Monetary Fund (IMF) and United Nations Conference for Trade and Development (UNCTAD) websites.

4.2 Unit Root test

In order to avoid generating spurious results as unit root is normally associated with especially with time series data, the researchers plotted the series to observe their trends. This can be seen in fig. 1 below. From this graph, there is clearly a discernible trend of movement which is upward trending and constant in some of the variables.

One can infer therefore that not all the series are stationary at all levels. The unit root test was then formally conducted on the variables to confirm the observations. In testing for the stationarity of the variables, the Philip and Perron (1988) the Engle and Granger (1987) Augmented Dickey Fuller (ADF) tests were used. These tests were carried out using intercept with trend in order to see how robust the outcome will be. In both the ADF and the Philip and Perron (PP) tests, the null and alternative hypotheses are:

H_0 : the residual series are not stationary or have unit root (EXPg, GDPg, IMPg and REM are not co-integrated).

H_1 : the residual series are stationary or have no unit root (EXPg, GDPg, IMPg and REM are co-integrated).

Rejection of the null hypothesis therefore means the series are stationary and thus co-integrated while the reverse will also be true.

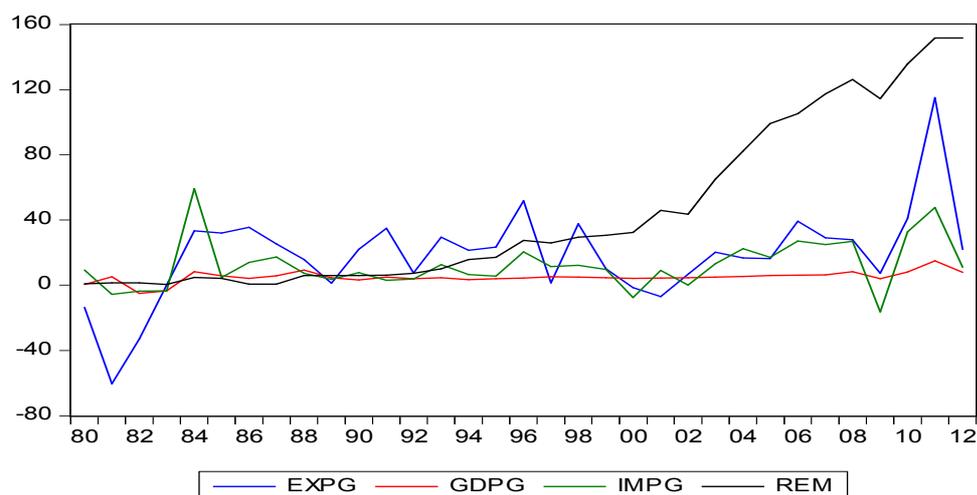


Figure 1: Trend in the variables, Source: Authors' Construct

4.3 Co-integration and Granger-causality Tests

We adopted the co-integration and Granger-causality tests through Vector Autoregressive Regression (VAR). The main reason here is to observe the causal dynamics between the variables under consideration and at the same time determine the long run dynamics between the variables. The co-integration test is conducted using the Johansen (1992) and the Johansen and Juselius (1992) framework. Below is the Granger-causality model we adopted;

$$Y_t = a_0 + \sum_{i=1}^m \beta_i Y_{t-y} + \sum_{i=1}^n \sigma x_{t-1} + \mu_t \quad (2)$$

If X_t Granger causes Y_t , then, the current values of Y_t are determined by past values of X_{t-1} . The test of H_0 , can be carried out with the F- test.

Due to the sensitivity nature of both the co-integration and the Granger-causality tests to lag lengths, we employed the VAR lag length selection criteria in choosing the appropriate lag lengths. As presented in the table below, lag 4 as the optimum lag length.

Table 1: Lag Length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-420.3544	NA	1.71e+08	30.31103	30.50135	30.36921
1	-349.6759	116.1147	3503928.	26.40542	27.35700*	26.69633
2	-340.6944	12.18920	6260185.	26.90674	28.61958	27.43037
3	-317.7722	24.55946	4726024.	26.41230	28.88640	27.16866
4	-276.4168	32.49358*	1236276.*	24.60120	27.83655	25.59028*
5	-257.9417	9.237506	2832138.	24.42441*	28.42102	25.64621

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

4.4 Model Specification for OLS Estimation

We adopted with modification the model used by Nyeadi et al (2014) to confirm the granger causality test using the Ordinary Least Squares (OLS) estimators. The model is specified below;

$$GDPgt = \alpha + \beta_1 REM_t + \beta_2 EXPg_t + \beta_3 IMPg_t + \varepsilon_t \quad (1)$$

Our dependent variable is GDPg = change in Gross Domestic Product

Independent Variables;

EXPg = change in Export

IMPg = change in Import

REM = Remittances inflow

β = Coefficients of the Explanatory Variables

ε = Error Term

t = Time Period

5. Empirical Results and Analysis

5.1 Summary Descriptive Statistics

Table 2 below also shows the summary statistics of the variables. With the mean, remittances flow has recorded the highest \$44.646 while change in GDP has the lowest mean figure. Again the remittance has the highest figure as far as the maximum figures of the statistics with again GDPg being the lowest. However, on the minimum figures of the descriptive statistics, export change has the lowest of -\$60.400 while remittance recorded the highest of the minimum of \$0.500. The standard deviation from the mean has \$3.394 of GDP change being the lowest while \$50.780 being the highest has been recorded by remittances flow to Ghana. All the variables have 33 annual observations.

Table 2: Background Statistics of the Variables

	EXPg	GDPg	IMPg	REM
Mean	18.484	5.011	12.287	44.644
Maximum	115.146	15.009	59.105	151.601
Minimum	-60.400	-5.038	-16.414	0.500
St. Dev.	28.226	3.394	15.098	50.780
Observations	33	33	33	33

5.2 Results of Unit root Test

The results of the test for stationarity are presented in table 3 below. Two of the variables namely EXPg and REM became stationary at the first difference using both the ADF and PP with constant and trend. This means the EXPg and REM are integrated order 0 i.e. I(0). This means that variables are cointegrated only at first difference and thus have no long run relationship. On the contrary, GDPg and IMPg are stationary at level meaning they have no unit roots and thus have long run relationship. This then called for the performance of co-integration test to confirm this since all the variables are not stationary at level. This stationarity at first difference can be clearly seen in figure 2 below where the graph plotted does not exhibit any discernible pattern that can be followed.

Table 3: Unit Root Test

	LEVEL		1 ST DIFF		INTERGRATED ORDER
	ADF	PP	ADF	PP	
EXPg	-3.883	-3.497	-4.101*	-9.287*	I(1)
GDPg	-4.394*	-4.639*	-2.501	-19.460*	I(0)
IMPg	-5.452*	-5.536*	-6.575*	-14.886*	I(0)
REM	2.86	-0.584	-4.326*	-6.124*	I(1)

Note: Significance at 1% is denoted by *. The stationarity test was carried using Constant with trend.

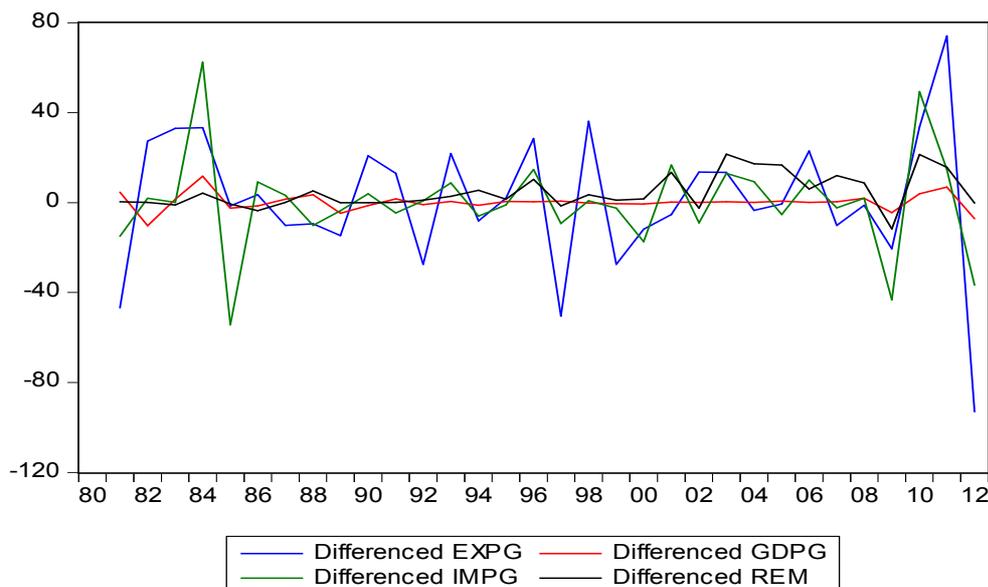


Figure 2: Non-discernible Trend in the variables

4.3 Results of Co-integration Test

Using the Johansen co-integration technique which involves the use of maximum Eigen values and the trace statistics, the results are presented in a summarized form in table 4 below. From the results, it can be realized that using both the Maximum Eigen value and Trace statistics, the model has three cointegrating vectors at the 5% level of significance since the null hypothesis of at zero at most one and at most two are both rejected against the alternative hypothesis.

Table 4: Co-integration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.797306	100.6917	47.85613	0.0000
At most 1 *	0.707453	56.00209	29.79707	0.0000
At most 2 *	0.523752	21.58645	15.49471	0.0053
At most 3	0.028708	0.815601	3.841466	0.3665

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.797306	44.68961	27.58434	0.0001
At most 1 *	0.707453	34.41565	21.13162	0.0004
At most 2 *	0.523752	20.77085	14.26460	0.0041
At most 3	0.028708	0.815601	3.841466	0.3665

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

4.4 Results of Granger-causality test

Presented in table 5 below are the results of the Granger-causality test. From the table, it is realized that there is

a causal link between remittances flow and the economic growth in Ghana. This link is however a unidirectional link in that it moves only from remittances to economic growth and not the vice versa. This means that remittances flow into the economy causes economic growth in Ghana.

Table 5: Results of Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
GDPG does not Granger Cause EXPG EXPG does not Granger Cause GDPG	29	0.60022 0.28593	0.6668 0.8836
IMPG does not Granger Cause EXPG EXPG does not Granger Cause IMPG	29	0.61280 2.41115	0.6583 0.0831
REM does not Granger Cause EXPG EXPG does not Granger Cause REM	29	2.04959 0.79573	0.1259 0.5419
IMPG does not Granger Cause GDPG GDPG does not Granger Cause IMPG	29	2.29024 1.49101	0.0954 0.2425
REM does not Granger Cause GDPG GDPG does not Granger Cause REM	29	4.59016 0.71939	0.0086 0.5887
REM does not Granger Cause IMPG IMPG does not Granger Cause REM	29	1.81018 2.47137	0.1665 0.0776

4.5 Results of OLS Regression

From the regression, the R^2 that measures the overall fitness of the model is 0.53 which indicates that 53% of the dependent variable can be explained by the depend variables. It is only 47% of the dependent variable that is explained by other variables outside the model. All the variables are jointly significant at 1% since our p-value is 0.0000. Our major independent variable, remittance is significant at 10% while both changes in export and import are significant at 1% and 5% respectively. All of them have positive coefficients signifying they are all positively significant which means that any amount of unit increase in any of the dependent variable will lead to an increase in the dependent variable. For instance, one unit increase in remittance will lead to 0.014 units of increment in economic growth. It is therefore a confirmation of the granger causality test which indicates that remittances lead to economic growth in Ghana. The model equation is stated below;

$$GDPgt = 2.771 + 0.014REM + 0.049EXPg + 0.062IMPg + \varepsilon \quad (3)$$

Table 6: Results of OLS Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXPG	0.048865	0.016755	2.916408	0.0069
IMPG	0.061995	0.030232	2.050648	0.0498
REM	0.014446	0.007460	1.936384	0.0630
C	2.771326	0.487032	5.690235	0.0000
R-squared	0.531506	Mean dependent var		5.153813
Adjusted R-squared	0.481310	S.D. dependent var		3.346132
S.E. of regression	2.409889	Sum squared resid		162.6118
Durbin-Watson stat	1.658358	Long-run variance		3.612205

6. Conclusion

Being effective in reducing poverty and promoting health in developing countries, remittances can also lead to

negative impact on labour supply, education and economic growth (Adams, 2010). The study used a time series data for 33 years on the Ghanaian economy to investigate the causal link between remittances and economic growth in Ghana. Granger-causality and co-integration tests were explored in the study. The study established that remittances lead to economic growth in Ghana. The link of causality is however a unidirectional one as economic growth does not lead to remittances. It is recommended that policies regarding emigration should be put in place to make it more encouraging to emigrate and remit to Ghana since remittances promote economic growth.

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