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Abstract

Empirically, results from time series and cross country studies have identified foreign capital inflows to play a pivotal role in the growth process of host countries. The goal of this article is to examine the impact of three of the four forms of foreign capital inflows (which include foreign aid, foreign direct investment and personal remittances) on economic growth in Ghana. The study employs the ARDL Bounds testing approach to cointegration on an annual time series data for Ghana from 1980-2012. The results of the study indicate that all the three forms of foreign capital inflows have positive and significant impacts on economic growth both in the short and long run. The results also show that of all the three forms of foreign capital inflows, foreign aid is the main driver of economic growth in Ghana both in the short and long run. The study recommends the design and implementation of good fiscal, monetary and trade policies to complement the flow foreign aid to the country for the realization of its full impact on growth.

1. Introduction

Foreign Capital Inflows (FCIs) play an important role in stimulating growth especially in host countries. FCIs are a key source of finance which accelerates the speed of economic development of developing countries through the transfer of modern technology and innovations of industrialized countries to developing countries (Fambon, 2013). Even though most empirical studies confirm a positive relationship between FCIs and economic growth, this relationship has been found to vary from one country to the other (Lipsey, 2000; DeMello, 1999) and hence the need for this single country study on Ghana. Also, the exact relationship between FCIs and economic growth sometimes depends on the form of FCI used (Orji et al. 2014; Fambon, 2013). There exist several forms of FCIs namely foreign aid[1], remittances[2], FDI[3] and foreign portfolio investment[4].

This study tends to differ from other studies in the sense that it carries out a single country study on the impact of FCIs on economic growth in Ghana by using three of the four main forms of FCIs namely; foreign aid, personal remittances and FDI. The reason for concentrating on these three is that, they constitute the most significant sources of FCIs in the Ghanaian economy. The claim also that FCIs foster growth has mostly been conducted in a cross sectional or panel way by drawing on the experiences of a large number of countries over a period of time (Orji et al.2014; Bowen,

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[1] Foreign aid refers to various terminologies like Official Development Assistance (ODA), grant, loan, technical and economic assistance.

[2] Remittances are mainly in the form of funds sent by non-resident to their household (resident) in the home country.

[3] FDI inflows is the sum of equity capital, earnings reinvestment, as well as other short and long terms capital.

[4] Foreign portfolio investment is a supplementary sort of foreign capital inflow which deals with the entry of funds into a country where foreigners make purchases in the country's stock and bond markets.

1998). Thus unlike existing empirical works, this paper focuses on examining the experiences of an individual country, Ghana, so as to present a detailed analysis of the FCIs-growth nexus.

The rest of the study is organized as follows; Section 2 presents a brief overview of Foreign aid, Remittances, FDI inflows and economic growth in Ghana whereas Section 3 discusses some relevant literatures on the relationship between economic growth and FCIs. Section 4 discusses the analytical framework and estimation technique whereas Section 5 presents the empirical results. Section 6 concludes the study with policy recommendations.

2. Brief Overview of Growth and FCIs into Ghana.

2.1. Changes in Real GDP

Figure 1 depicts the growth rates of real GDP and real GDP per capita for Ghana over the period 1980-2012. The growth rates of real GDP over the past three decades appears to have settled around 5% level. According to Aryeetey and Kanbur (2005), Ghana experienced a reasonably high growth rates in the 1950s and early 1960s till it began to experience a slowdown in 1964.Growth was turbulent during much of the period after mid-1960s and began to stabilize by 1984.Ghana has experienced both negative and positive growth rates over the past years with the lowest ever growth rate (-14%) and highest ever growth rate (14.4%) occurring in 1975 and 2011 respectively. Aryeetey and Tarp (2000) attributed the growth in the 1980s to the expansion and injection of capital resulting from increased aid inflows. However, the negative growth in the early 1970s and early 1980s have been attributed to successive changes in government and explosive policy changes or reversals. The highest ever growth rate which occurred in 2011 was mainly attributed to the growth in the oil sector.

Figure 1 here

2.2. FDI, Foreign Aid and Remittances to Ghana

The three most important forms of FCIs to Ghana are foreign aid, remittances and FDI. Successive governments have made strenuous efforts through institutional, legal frameworks and promotion campaigns to attract FDI into the country. This has resulted in a rapid increase in FDI inflows (Figure 2) especially to the mining sector which has emerged from a prolonged slump and virtual decay to become the largest beneficiary of FDI inflows in Ghana. FDI inflows in Ghana in the early 1980s were low as a result of the negative economic growth rates at that time which looked unattractive to foreign investors. The launching of the Economic Recovery Programme (ERP) in 1983 which was aimed at arresting the negative growth rates yielded positive results given an average growth rate of 5% from 1984-1991. FDI inflows in the 1980s were very sluggish averaging $4 million per annum but increased to $18 million during the early 1990s (Figure 2). FDI inflows increased substantially peaking at $233 million in 1994 but falling back to about $107 million the following year but still remaining considerably higher than previous years. FDI inflows in Ghana have increased from about $15 million in 1980 to $3 billion in 2013 partly resulting from high and sustained economic growth rates as well as political stability over the years.

Foreign Aid is an importance source of financing developmental projects in Ghana. The country's status as a lower middle income country implies that lending and grants (official) is likely to reduce but Official Development Assistance (ODA) will still play an important source of development finance for Ghana in the short-to medium-term (Osei, 2012). Ghana gets aid in

the form of budgetary and project support just like other aid recipient developing countries. Net ODA to Ghana increased from about US$190 million in 1980 to peak at about US$1.4 billion in 2004 and later increasing to about US$1.8 billion in 2012 (Figure 2). Net ODA decreased over the period 2005-2006 as shown in Fig 2 because Ghana was undergoing HIPC[5].

Personal Remittances[6] in Ghana have been quite stable in most of the years from 1980-2000. The implementation of the Structural Adjustment Programmes (SAPs) and the Economic Recovery Programmes (ERPs) in the early 1980s didn't quite cause a rapid increase in personal remittances because the main focus of these programmes was to arrest the negative economic growth rates at that time. Personal remittances began to rapidly increase after the year 2002 when the economy began experiencing higher growth rates. Personal remittances increased from about US$900,000 in 1980 to about US$119 million in 2013 (Figure 2). Government now considers remittances to be one of the important sources of foreign exchange inflows which not only leads to economic growth but also leads to reduction in poverty[7].

Figure 2 here

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[5] HIPC-Highly Indebted Poor Country
[6] Personal remittances are the sum of personal transfers and compensation of employees. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from nonresident households. Compensation of employees on the other hand refers to the income of border, seasonal and other short-term workers who are employed in an economy where they are not resident and of residents employed by nonresident entities.
[7] It is asserted that that 10% increase in foreign remittance as a share of GDP is estimated to result in a 3% decline in people living in poverty (Anyanwu and Erhijakpor, 2008).

3. Literature Review

Even though most of the empirical studies on the relationship between FCIs and economic growth among various countries is positive, the relationship between the two are still inconclusive. In the following section, we present a review of some studies with specific focus on the link between the following: FDI and growth; Remittances and growth; Foreign aid and growth.

3.1 FDI and Growth

FDI has been identified in the empirical literature especially in the neoclassical and endogenous growth models as a major factor that promotes growth. Studies using the endogenous growth models conclude that FDI promotes growth. One of such studies is Blomstrom et al. (1996) which argues that FDI can promote growth through capital formulation and technological transfer. De Mello (1997) extends the link between FDI and growth by asserting that, FDI promotes growth by increasing the level of knowledge through in-service training and acquisition of skills. On a broader scale, endogenous growth models provide three main channels through which FDI contributes to growth. Firstly, FDI tends to increase capital accumulation in recipient countries through the introduction of new technologies (Blomstrom et al. 1996). Secondly, FDI tends to increase the levels of skills and knowledge in recipient countries through the training of workers and managers on the jobs (De Mello, 1996). Lastly, FDI helps overcome barriers to entry and reduce market power of existing firms by boosting competition among the industries of the recipient countries.

Some of the studies on the relationship between FDI and growth also have the neoclassical growth models as the basis. One of such studies is Chowdhury and Mavrotas (2005) which identifies the four principal channels through which FDI promotes growth namely: (i) the determinants of

growth; (ii) the determinants of FDI; (iii) the role of multinational firms in host countries; and (iv) the direction of causality between the two variables.

Using a time series data for the period 1975-2006 for Ireland and employing the Autoregressive Distributed Lag Model (ARDL), Kim and Bang (2008) found a long term relationship between FDI and economic growth. The long and short run results indicated a statistically positive significant relationship between FDI and economic growth over the study period. Employing an Engel-Granger two-step methodology as well as the Dynamic Ordinary Least Squares (DOLS), Insah (2013) found the elasticity of economic growth with respect to FDI to be positive and also significant at 1% level of significance. The study used a time series data for Ghana during the period 1980-2010 to investigate the dynamic relationship between economic growth and FDI inflows. Orji et al. (2014) examined the impact of all the four different forms of FCIs on output growth of the West African Monetary Zone (WAMZ) comprising of Ghana, Nigeria, Sierra Leone and Gambia over the period 1981-2010. Using the Seemingly Unrelated Regression Estimation (SURE), the study found FDI to positively contribute more to output growth in Nigeria and Gambia.

Even though some studies such as De Mello (1997) confirm the positive association between FDI and growth, these studies also argue that this positive association can only occur under a certain number of conditions such as existing trade regimes, financial market regulations and banking systems, degree of openness of their economies as well as the levels of human capital in the host countries. De Mello (1997) and OECD (2002) for instance argues that the impact of FDI on growth tends to depend on the economic and technological conditions that exist in the host countries.

These studies especially De Mello (1997) and OECD (2002)[8] further stress that, developing countries in particular must achieve a certain level of education and infrastructure development before they can fully enjoy the benefits of FDI on growth. Lastly, it should also be noted that even though the relationship between FDI and economic growth in most empirical studies is positive, studies such as Carkovic and Levine (2005) and Gorg and Greenway (2004) which were carried out at the firm level found otherwise.

3.2 Remittances and Growth

Katsushi et al. (2012) outlines three ways in which remittances impact growth. The first way is through its impact on the rate of capital accumulation. The study asserts that remittances increase the rate of accumulation of both physical and human capital thereby lowering the cost of capital in the recipient country. The second way is through its impact on labour force growth. Whereas remittances have a positive impact on the rate of capital accumulation, remittances receipts have a negative impact on labour force participation. This relationship happens as workers substitute remittance income for labour income. The third and last way is through its impact on total factor productivity growth. The effect of remittances on total factor productivity may be negative or positive depending on the person making the investment decision. In the case of formal capital inflow, the impact of remittances on growth via total factor productivity will be positive if the investment decision is made by a skilled domestic financial intermediary as compared to recipient making the decision on behalf of the remitter.

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[8] OECD (2002) is a journal which supports the positive association between FDI and economic growth. This study found 11 studies out of 14 studies that FDI positively influences economic growth

Remittances have also been identified as one of the key capital flows that do not only benefit the recipients' households but also the recipients' country. Notwithstanding that, empirical results on the relationship between growth and remittances have produced mixed results. Studies that confirm a positive relationship between growth and remittances assert that remittances; contribute to poverty reduction in recipients' countries by increasing cash flows and also helps in reducing the current account deficit as well as external debt of the recipients' country; increases the rate of accumulation of both physical and human capital (Iqbal and Satter, 2008; Adams, 2006; Vargas-Silva et al, 2009)[9]. There is also empirical evidence that remittances lead to positive economic growth through their positive impact on investment. To test the hypothesis that remittances have a positive relationship with employment and productivity through its impact on investment, Leon-Ledesma and Piracha (2004) conducted a study on eleven transition economies. The study confirmed the view that remittances have a positive impact on productivity via its positive impact on investment.

However, studies that confirms a negative relationship between growth and remittances argue that remittances tend to degrade long run growth by; creating labor substitution and "Dutch disease' effects, influencing inflation, appreciating the real exchange rate and reducing the labour market participation rates by substituting remittance income for labour income (Chami et al,2003; Barajas et al, 2009).

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[9] For a comprehensive review of literatures on remittances, see Rapoport and Docquier (2005)

3.3 Foreign aid and Growth

The empirical findings on the link between foreign aid and growth are generally mixed depending on whether it is a panel study, cross sectional study or a country specific study[10]. Studies that confirms a positive relationship between foreign aid and growth argue that foreign aid stimulates economic growth by: supplementing domestic sources of finance such as savings; increasing physical and human capital investment; increasing the capacity to import capital goods and technology (Hansen and Tarp, 2000; Dalgaard et al., 2004; Karras, 2006). However, other empirical studies found a negative relationship between growth and foreign aid (Burnside and Dollar, 2000; Brautigam and Knack; 2004). Studies such as Mosley at al. (1987) and Jensen and Paldam (2003) found no relationship between foreign aid and growth. Papanek (1973) disaggregated foreign capital inflows into foreign aid, foreign private investment and all other foreign inflows[11]. Using a cross section data of 34 countries in the 1950s and 52 countries in the 1960s, foreign aid was found to have a statistically significant positive impact on growth. Moreover, the study found the effect of foreign aid on economic growth to be stronger than other factors. Other studies have also moved from cross country studies to time series specific country studies in examining the relationship between economic growth and foreign aid. Fambon (2013) employed the ARDL framework on a time series data for Cameroun over the period 1980-2008. Even though the study found a positive relationship between foreign aid and economic growth, this relationship was not statistically significant.

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[10] For a comprehensive review of theoretical and empirical literatures on foreign aid and growth, see McGillivray et al. (2006).

[11] Other foreign inflows include net private transfers, net short term borrowing, other capital (net) and errors and omissions in the balance of payments.

4. Methodology

4.1 Analytical Framework

Following the work of Fambon (2013), the study uses an aggregate production function (Y_t) which integrates Personal Remittances (PR), FDI, Foreign Aid (FA) and other control variables in the model. This framework is based on the endogenous growth model where the aggregate production function is in a Cobb-Douglas form given as;

$$Y_t = A_t K_t^{\alpha} L_t^{\beta} e^{\varepsilon_t} \quad (1)$$

Where Y_t represents the output of the economy measured by real GDP at time t; A_t represents the level of technology at time t (productivity factor); K_t represents the level of capital stock at time t; L_t represents the labour stock at time t; ε_t represents the error term and e is a base of natural logs. The impacts of PR, FDI and FA may be captured through the A_t component of the production function. We therefore assume that A_t is a function of PR, FDI and FA. This can then be represented as;

$$A_t = f(PR_t, FDI_t, FA_t) = PR_t^{\delta} FDI_t^{\mu} FA_t^{\psi} \qquad (2)$$

Equation (3) below is obtained by combining equations (1) and (2);

$$Y_t = K_t^{\alpha} L_t^{\phi} PR_t^{\delta} FDI_t^{\mu} FA_t^{\psi} e^{\varepsilon_t} \quad (3)$$

where α, ϕ, δ, μ and ψ are the constant elasticity coefficients of output relative to K, L, PR, FDI and FA.

Taking natural logs of equation (3) gives;

$$InY_t = \alpha InK_t + \phi InL_t + \delta InPR_t + \mu InFDI_t + \psi InFA_t + \varepsilon_t \ (4)$$

For estimation purposes, Equation (4) can be rewritten as;

$$InY_t = \omega + \alpha InK_t + \phi InL_t + \delta InPR_t + \mu InFDI_t + \psi InFA_t + \varepsilon_t \tag{5}$$

Where all the variables are defined as previously; ω is the constant term, and ε_t is the disturbance term assumed to be independently and normally distributed with zero mean and constant variance.

The choice of these variables are justified by a plethora of empirical studies (Fambon, 2013; Kim and Bang, 2008). Y_t is proxy by real GDP; K_t is proxied by the share of gross domestic investment in GDP; L_t is proxied by the total labour force of the country; PR_t is defined as the personal remittances (current \$US) received by residents; FDI_t is Foreign Direct Investment, net inflows as a percentage of GDP; FA_t is proxied bythe Net Official Development Assistance (ODA) received per capita (current \$US).

In terms of a priori expectations, the literature predicts a positive relationship between L_t, K_t, PR_t, FDI_t and real GDP. Even though the relationship between FA_t and real GDP in the literature can either be positive or negative, we expect the coefficient of FA_t to be positive.

4.2 Estimation Technique

The Auto Regressive Distributed Lag (ARDL) Bounds Testing approach developed by Pesaran et al. (1999) was used to investigate the long run equilibrium relationship between the explanatory

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variables and real GDP in Ghana. This technique is used to test the existence of long run relationships between variables in multivariate time series models irrespective of whether the underlying explanatory variables are either integrated of order zero I(0), one I(1) or mutually cointegrated. The study employed the ARDL approach because of its advantages such as the involvement of just a single equation set-up making it easier and simpler to interpret compared to other conventional techniques such as the Engel Granger two-step residual-based procedure, Johansen system-based reduced rank regression approach and variable addition by Park (1990), etc. which involves several equation set-up. According to Afzal et al. (2010), the ARDL approach produces unbiased and efficient estimates because it is able to avoid the problems of serial correlation and endogeneity.

The ARDL approach is first carried out by estimating Unrestricted Error Correction Model (UECM) in equation (6) using the OLS.

$$\Delta InY_t = \beta + \sum_{j=0}^{a}\lambda_{1j}\Delta InK_{t-j} + \sum_{j=0}^{b}\lambda_{2j}\Delta InL_{t-j} + \sum_{j=0}^{c}\lambda_{3j}\Delta InPR_{t-j} + \sum_{j=0}^{d}\lambda_{4j}\Delta InFDI_{t-j} + \sum_{j=0}^{e}\lambda_{5j}\Delta InFA_{t-j}$$

$$+\delta_1 InY_{t-1} + \delta_2 InK_{t-1} + \delta_3 InL_{t-1} + \delta_4 InPR_{t-1} + \delta_5 InFDI_{t-1} + \delta_6 InFA_{t-1} + \varepsilon_t \qquad (6)$$

where Δ is a difference operator, *a, b, c, d, e* represent the lag length on the regression variables and ε_t is the error term assumed to be white noise. The parameters, λ_{nj} for n=1, 2, ..., 5, represent the short run dynamics of the model whereas the parameters for the long run relationships are given by the δ's.

The UECM examines the long run relationships between the variables and in doing so, the F test is used to test for the joint significance of the coefficients of the lagged level variables. The Bound test developed by Pesaran et al., (1999) is the Wald test for the lagged level variables. Hence, we test the null hypothesis of non-cointegrating equation by performing a joint significance test on the lagged level variables. The null and alternative hypotheses for testing for the cointegration are given as:

H_0: $\delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = 0$

H_1: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq 0$

According to Pesaran et al., (1999), upper and lower critical values are chosen based on the order of integration of the explanatory variables. The upper critical values are based on the assumption that the explanatory variables are integrated of order one whereas the lower critical values are based on the assumption that the explanatory variables are integrated of order zero. Under the conventionally used level of significance such as 10%, 5% and 1%, we reject the null hypothesis of no cointegrating equation if the F-statistic exceeds the upper critical value. We also fail to reject the null hypothesis of no cointegrating equation if the F-statistic falls below the lower critical value.

In the final step of the ARDL approach, the short-run dynamics associated with the long run estimates are ascertained by constructing an Error Correction Model (ECM) as shown in equation (7):

$$\Delta InY_t = b_0 + \sum_{j=0}^{p} b_{1j} InY_{t-j} + \sum_{j=o}^{q} b_{2j} \Delta InK_{t-j} + \sum_{j=o}^{r} b_{3j} \Delta InL_{t-j} + \sum_{j=o}^{s} b_{4j} In\Delta PR_{t-j} + \sum_{j=o}^{t} b_{5j} \Delta InFDI_{t-j} +$$

$$\sum_{j=o}^{u} b_{6j} \Delta InFA_{t-j} + \Omega ecm_{t-1} \qquad\qquad (7)$$

where Δ is a difference operator, *p, q, r, s, t, u* represent the lag length on the regression variables, b_{mj} for j=1, 2,3,…, 6 are the short run equation coefficients, Ω is the speed of adjustment to the long run equilibrium.

Annual time series data on the variables spanning from the time period 1980 to 2012 was used. All data for this study was obtained from the World Development Indicators (WDI)of the World Bank

5. Results

5.1. Unit root and Cointegration Results

Summary statistics of the variables are shown in Table 1 below. With the exception of variables such as Labour and FDI, all the remaining variables had a total number of 33 observations. The unit root properties of the variables were ascertained and results shown in Table 2 using the Philip Peron (PP) and Augmented Dicky Fuller (ADF) tests. For the variables Labour and Personal Remittances which were stationary at levels, all other variables were stationary at first difference. The results of the test for cointegration between these variables are shown in Table 3. The cointegration results confirms the existence of a statistically significant cointegration relationship between the variables as the Bounds test F-statistic (4.323245) exceeds the upper bound critical value (3.34).

Table 1 here

Table 2 here

Table 3 here

5.2. Diagnostic tests

Forecasting requires that the model is free from issues such as serial correlation, Heteroscedasticity and so on. As a result, some diagnostic tests are conducted to ascertain the suitability of the model for forecasting. Given the p-values of serial correlation, functional form, normality and heteroscedasticity of 0.080, 0.323, 0.013and 0.293 respectively (Table 4), we fail to reject the null hypothesis of no serial correlation, correct functional form, normally distributed residuals and homoscedasticity at 1% level of significance. This implies that our model is correctly specified.

The Cumulative Sum (CUSUM) and the Cumulative Sum of Squares (CUSUMSQ) techniques are employed to access the stability of the short run and long run elasticities. We test the null hypothesis of stable parameters against the alternative hypothesis that both the long and short run parameters are not stable. The plots of CUSUM (Figure 3) and CUSUMSQ (Figure 4) are well within the critical bounds implying that the estimated model and its coefficients are stable at 5% level of significance. This stability results according to Hossain (2012) implies that the our model can be used for the purpose of policy decision making in such a way that the impact of policy

changes with regards to the explanatory variables of the economic growth equation will not cause a major distortion in the level of growth.

Table 4 here

Figure 3 here

Figure 4 here

5.3. Long Run Elasticities

The long run model for the ARDL was estimated based on the Schwarz Bayesian criterion with a model selection of (1, 0, 0, 0, 0, 0). Estimation of the long run elasticities presented in Table 5 indicates that all the three forms of foreign capital inflows namely; Foreign Aid, Personal Remittances and FDI are all statistically significant and are long run drivers of economic growth in Ghana It can also be observed that, most of the long run elasticities of the regression variables have their expected theoretical signs.

Specifically, the FDI elasticity of growth is positive, inelastic and significant at 5 percent level of significance. Thus, a 1 percent increase in FDI will lead to a 0.07 percent increase in income (real GDP per capita), all other variables held constant. This inelastic FDI effect is consistent with that of the findings of Insah (2013) who obtained an inelastic, significant and positive FDI elasticity of growth to be 0.128. This same result is also consistent with other findings from other developing

countries such as Fambon (2013) and Raza et al. (2011). According to the World Investment Report (2012), Ghana has witnessed huge FDI inflows over the past decade as a result of the discovery of oil. This among other things have made it possible for Ghana to record an average real GDP growth rate of about 8.11% since the discovery of oil in 2007. It is reported that about 70% of Ghana's FDI inflows are into the extractive and mining sectors which have been a key backbone in Ghana's impressive growth trajectory over the past decade.

As expected, the personal remittances elasticity of growth is also positive, inelastic and significant at 1 percent implying that all other variables constant, a 1 percent increase in personal remittances will lead to a 0.23 percent increase in income (real GDP per capita). This result is in consonance with other studies such as Vargas-Silva et al. (2009) and Iqbal and Satter (2008). Over the years, migrant workers from Ghana continue to increase as they leave to Europe, Asia and other parts of the world to seek greener pastures. This increase in migrant workers is evidenced by the rapid increases in migrant transfers to Ghana (Figure 2) and the proliferation of money transfer institutions in Ghana (both formal and informal). Quartey (2006) reports that migrant worker remittances have over the years been the backbone of many Ghanaians especially in times of economic shocks. The study further reports that migrant remittances from abroad are becoming a potential source of external finance with its magnitude exceeding the amount of ODA in some developing countries and a potential force to contribute to growth via the channeling of these funds into productive sectors of the economy. Quartey (2006) in his study confirms our results and that remittances do not only promote growth but also improve household welfare.

The study also found the elasticity of growth of foreign aid to be positive, elastic and statistically significant at 5 percent level of significance. This suggests that, a 1 percent increase in foreign aid will lead to a 0.64 percent increase in income (real GDP per capita). Although Osei (2012)

concedes that there would be a reduction in ODA in the long term because of the start of the oil production and Ghana's new status as a lower middle income country, the study concluded that ODA will still be an important component of growth and an important source of development finance for Ghana especially in the short to medium term. The study further asserts that growth and structural change in Ghana have been mainly driven by private investment (financed from aid). This assertion tends to support our results that foreign aid is a key component of growth in Ghana.

Therefore as shown in Table 5, all the three forms of foreign capital inflows are significant long run drivers behind the surge in growth in Ghana, with foreign aid having the largest impact as shown by its high elasticity as compared to the other elasticities of the other two forms of foreign capital inflows.

Table 5 here

5.4. Short Run Elasticities

Table 6 presents the results of the ECM and the estimated short run elasticities of the variables. The results of the estimated ARDL model indicate that all the three forms of foreign capital inflows are short run drivers of growth in Ghana. An interesting observation on the elasticities is that, foreign aid had the highest elasticity implying that the main driver of growth in Ghana in the short run among the three forms of foreign capital inflows is foreign aid. The impact of FDI on growth is positive and statistically significant at 10 percent level of significance. A 1 percent increase in FDI causes an increase in growth by 0.005 percent in the short run, all other things held constant.

The impact of personal remittances and foreign aid on growth are also positive and statistically significant at 5 and 1 percent level of significance respectively. Thus, with a 1 percent increase in personal remittances and foreign aid, growth is expected to increase by 0.02 and 0.05 percent respectively in the short run.

The sign of the coefficient of the lagged ECM term in Table 6 is negative and statistically significant at 1 percent and supports the conclusion of cointegration between the variables in the long run (Muhammad et al.2011). The error correction term of -0.0725 suggests that when economic growth is above or below its equilibrium level, it adjusts by almost 7.25% within the first year.

Table 6 here

6. Conclusion and Recommendations

This study aimed at examining empirically the relationship between economic growth and three of the four forms of foreign capital inflows namely; foreign direct investment, personal remittances and foreign aid in Ghana. This goal was achieved by using an annual time series data from 1980-2012 and the ARDL Bounds testing approach.

All the three forms of foreign capital inflows used in this study positively affect economic growth in Ghana both in the short and long run. However, Foreign Aid (proxied by Net Official

Development Assistance (ODA) received per capita in current $US) was found to be the main driver of economic growth both in the long run and short run among the various forms of FCIs.

The study therefore recommends the need for FDI to be targeted into sectors where Ghana has a comparative advantage for the economy to experience a wider coverage of FDI impact on growth. Furthermore, there is the need for the government of Ghana to design and implement sound fiscal and monetary policies aimed at macroeconomic stability in order to create and improve an enabling environment to attract more domestic and foreign investors. There is also the need for government bodies and NGOs to assist in educating remittance recipients to adopting savings culture and not to see remittances as a substitute for their labour income.

Lastly, even though the study found foreign aid to be the main driver of economic growth in Ghana, the impact of foreign aid on growth can only be fully realized in the presence of good fiscal, monetary and trade policies.

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LIST OF TABLES

Table 1: Summary Statistics of Variables from 1980-2012

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
Real GDP	33	6.078042	0.206319	5.770818	6.593318
Capital	33	2.719786	0.592845	1.261717	3.496508
Labour	23	15.92511	0.181447	15.59091	16.19312
Remittances	33	16.56277	1.786564	13.12236	18.83676
FDI	32	-0.101050	1.593669	-3.093829	2.253044
Foreign Aid	33	3.566139	0.545188	2.201213	4.290459

Source: Authors' computation

Table 2: Results of ADF and PP unit root tests

Variables	ADF unit root test	Phillips-Perron unit root test
	At levels	
Real GDP	-0.200936ǂ	-2.423173ǂ
Capital	-2.169393ǂ	-2.087011ǂ
Labour	-2.344551ǂ***	-2.833221***!
Remittances	-4.452247ǂ***	-4.343187ǂ***
FDI	-0.832476!	-0.759529!
Foreign Aid	-1.353175!	-1.353175!
	At first difference	
Real GDP	-5.828264ǂ***	-3.394440ǂ*
Capital	-5.737775ǂ***	-9.974535ǂ***
Labour	-	-

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Remittances	-	-
FDI	-5.100264!***	-5.181137!***
Foreign Aid	-7.809825!***	-7.618450!***

*Note: *, **, ***, represent 10%, 5% and 1% significant levels. ǂ and ! denote constant with trend and constant only model specifications respectively.*

Table 3: Cointegration Results

Computed ARDL F-Statistic	4.323245(0.0306)**
Bounds Test critical values at 5% level of significance: (with no intercept and no trend) Lower Bound: 2.14 Upper Bound: 3.34	
K=5, where K is the number of explanatory variables in the model.	

Source: Authors' computation.** represents significant at 5% level of significance.

Table 4: Results of ARDL Diagnostic tests

Test Statistic	LM Version	F Version
A: Serial Correlation	CHSQ(1)=3.0576(0.080)	F(1,24)=2.6262(0.118)
B: Functional Form	CHSQ(1)=0.97760(0.323)	F(1,24)=0.78150(0.385)
C: Normality	CHSQ(2)=8.7492(0.013)	Not Applicable
D: Heteroscedasticity	CHSQ(1)=1.1065(0.293)	F(1,24)=1.0734(0.309)

Source: Authors' Estimation. Figures in parenthesis are the P-values.

Note:A: *Lagrange multiplier test of residual serial correlation;***B:** *Ramsey's RESET using the square of the fitted values***; C:** *Based on a test of skewness and kurtosis of residuals***; D:** *Based on the regression of squared residuals*

Table 5: Estimated Long Run Coefficients

| Regressor	Coefficient	Standard Error	T-Ratio
Labour	-0.026561	0.018655	-1.4238
Capital	0.18694	0.25730	0.72656
FDI	0.066141	0.065506	1.0097**
Personal Remittances	0.22718	0.055218	4.1142***
Foreign Aid	0.64434	0.24153	2.6677**

*Source: Author's estimations. *, **and *** above represent significant at 10%, 5% and 1% level of significance respectively*

Table 6: Results of Error Correction Model

Regressor	Coefficient	Standard Error	T-Ratio
dLabour	-0.0019261	0.0013657	-1.4103
dCapital	0.013556	0.017783	0.76230
dFDI	0.0047962	0.0052763	0.90901*
dPR	0.016474	0.0071665	2.2987**
dFA	0.046724	0.014724	3.1732***
ecm(-1)	-0.072515	0.016676	-4.3484***

*Source: Author's estimations. Note: *, **and *** above represent significant at 10%, 5% and 1% level of significance respectively.*
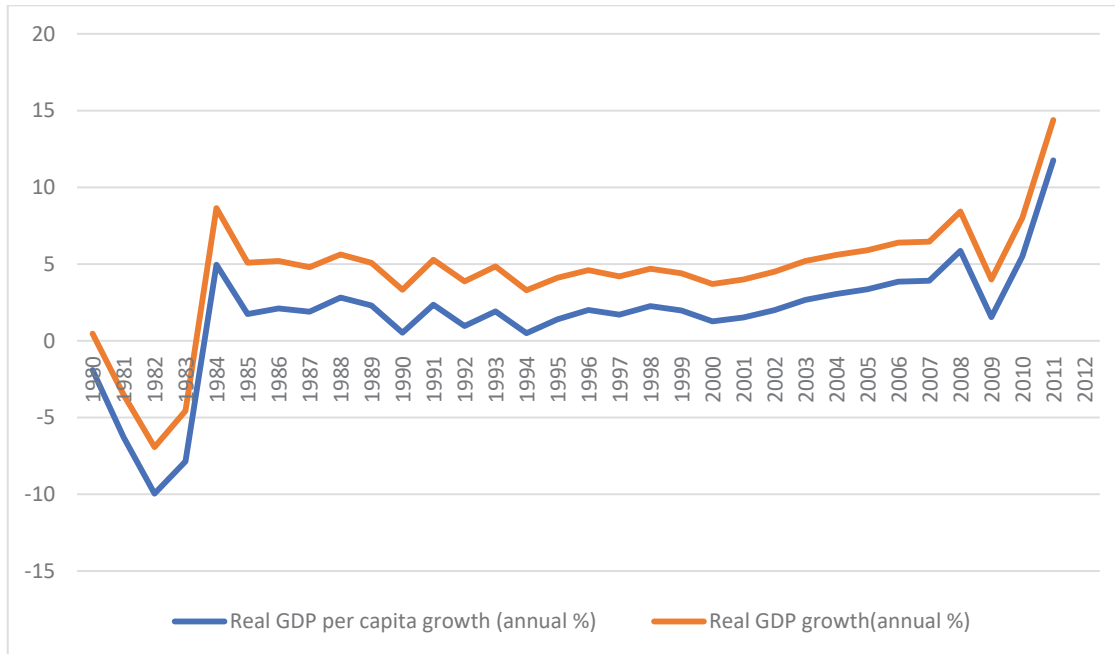
Source: WDI (2010)

Figure 1: Real GDP and Real GDP per capita growth (1980-2012)
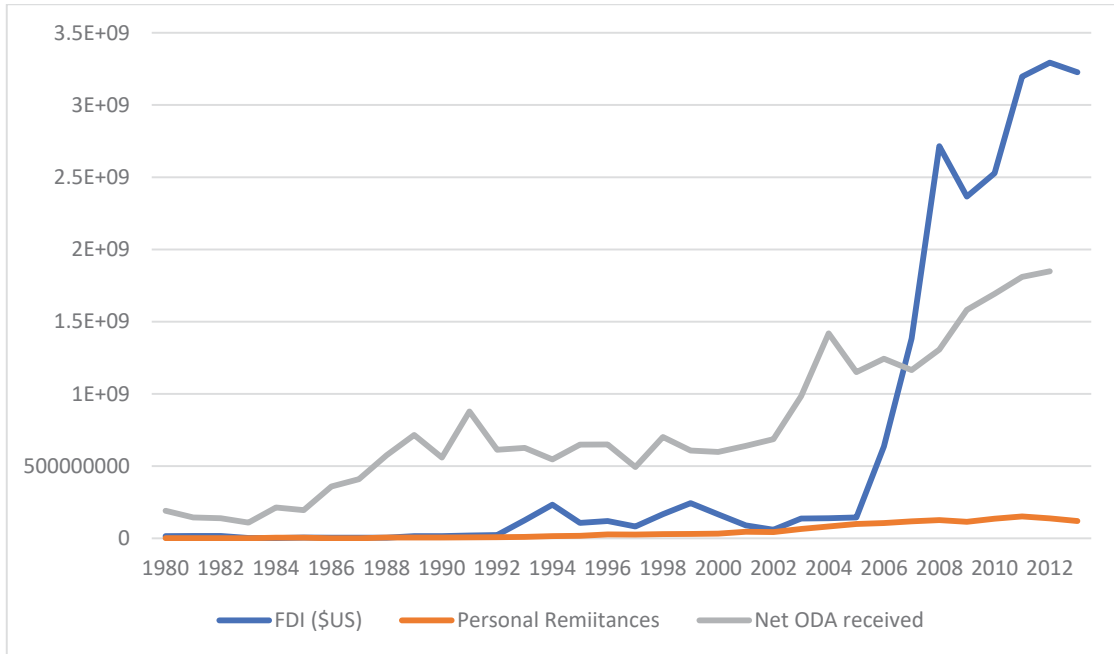
Source: WDI (2010)

Figure 2: FDI, net inflows, Personal Remittances Received and Net ODA received (1980-2011;BoP, current $US)
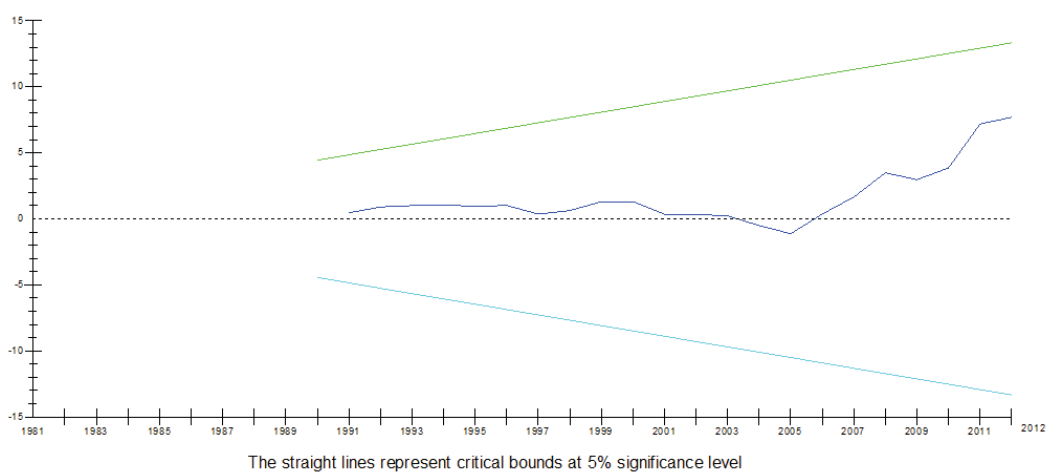

The straight lines represent critical bounds at 5% significance level

Fig 3: *Plot of Cumulative Sum of Recursive Residuals (CUSUM)*

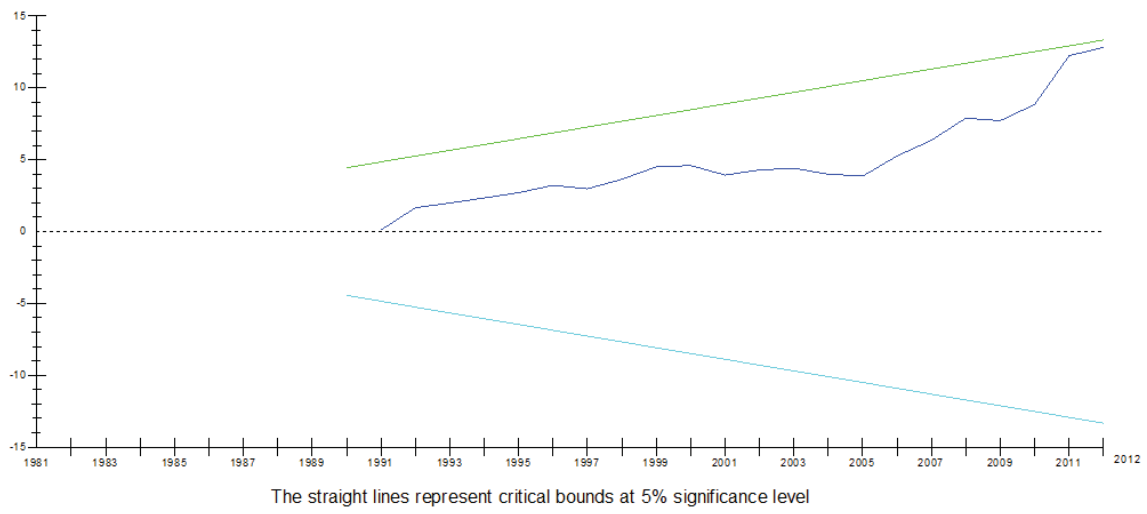The straight lines represent critical bounds at 5% significance level

Fig 4: *Plot of Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ)*