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THE EFFECT OF PERSONAL REMITTANCE ON ECONOMIC GROWTH IN SUB SAHARAN AFRICA

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Abstract:
The objective of this paper is to analyze the macroeconomic effects of personal remittance in 29 countries located in the Western and Eastern African regions. The variables on which the effect is considered were the current accounts balance & economic growth. The study covered a panel data of 2000-2014. The estimation models taken in to consideration were fixed effects and random effects models. For an estimate of the data for the countries together, for the economic growth, random effects model was found to be the appropriate by applying the Hausman model specification test and Breusch-Pagan Lagrangian Multiplier (LM) test. But for segregated estimation of the data in to the West and East regions, random effects for the Eastern and fixed effects for the Western become the appropriate estimation models by using the same tests. Based on the estimation, remittance has statistically significant and positive effect on economic growth in the countries together. When remittance increases by 10%, the economy grows by 1.47%. Plus, a 10% rise in per capital remittance causes, a 1.14% growth in per capita GDP. When the result is compared in the two regions, the effect in the East is greater than in the west. Governments in Sub-Saharan Africa should work towards smoothing the flow by reducing cost of transfer, to promote saving by the recipient households so that remittance will be made more productive and the tackle problems of transfer to bring the informal flow to the formal way.

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Keywords: personal remittance, macroeconomic effect, remittance in Africa, remittance growth effect

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1. Introduction

1.1 Background of the Study

Labor mobility crossing international borders is an increasing phenomenon more than ever before (Ratha, 2013). The growth rate of remittances is greater than the growth rate of FDI and official development assistance (Fayissa and Nsiah, 2008). According to Bannga and Sahu (2010), remittance scored an annual growth rate of 17.7% between 2004 and 2008. Moreover, Sub-Saharan Africa had the second highest growth rate during the same period (29.3%) next to Europe and central Asia (32.5%). The number of worldwide migrant workers increased from 84 million in 1970 to 194 million in 2005 (Naude and Bezuidenhout, 2012). Around 3% world population are considered as migrant (Adams JR. and Page 2005; Hagen-Zanker, 2010; Yaseen, 2012). The cause and way (legally or else) of migration differs from country to country (Hagen-Zanker, 2010). Whatever reason is for migration, workers send a certain portion of their income back to origin (home) countries. The amount remitted has increased from $2 billion in 1970 to more than $433 billion in 2008 (Naude and Bezuidenhout, 2012). Developing countries take the largest share of remittances (75%) out of the international total remittance (Emerta et al., 2010).

According to Anderson (2014), approximately 30 million Africans are found in other continents. This represents about 3% of the continent's population (Ratha, et al., 2011). Arising from altruism behavior (i.e. attachment to family members left behind) they send remittances to their respective families. Workers' remittance represents a larger source of hard currency to some of the Sub Saharan nations (Singh, 2009). The amount of the financial flow showed an increasing trend because of increased migrants particularly to rich nations and reduction in transaction cost of remittance flow (Kapur, 2003; Ncube and Brixiova, 2013; Siddique, 2010). For instance, it was estimated to be about $40 billion during 2010 which is about 2.5% of the continent's GDP. It served as a source of financial resource to reduce the level and severity of poverty in the developing hemisphere of the globe (Ratha, 2013). The concern of this paper is to examine the impact of personal remittance on improving the current accounts balance, growth in nominal GDP &per capita GDP and poverty reduction.

1.2 Statement of the Problem

Opong (2012) stated that when people consider international financial flow, specially to poor nations, the source that comes first in to their mind is either foreign direct investment or portfolio investment or development assistance (ignoring the role of remittance). However, taking the 2011 data Ratha (2013) confirmed that recorded remittance flow to developing economies is estimated to be 3 fold more than official development assistance and it was about half of FDI in such nations.

Remittance is found to be less volatile (more stable) relative to FDI and it acts as counter-cyclical, i.e. migrant workers send more during hardship times even if the host economy is not functioning well (Kapur, 2003; Naudé and Bezuidenhout, 2012; Pradhan, et al. 2012; Ratha, 2013). As an example, during the world financial crisis

remittance decreased by 5.27% whereas FDI declined by 32.94%. Even after relief of the crisis, FDI responded very slowly as compared to remittance. This is seen from data between 2009 and 2011 while remittance increased by 25.29% and FDI increased only by 0.59% (Ratha, 2013).

Migration and remittance have attracted the attention of researchers and policy makers because of its size and economic effects in recipient countries. Despite this growing essence in worldwide financial flow, its relationship with economic growth in SSA has not been studied well (Fayissa and Nsiah, 2008). Migration is considered as a household mechanism to solve the challenges they face due to imperfect market such as credit, insurance and investment limitations (Anderson 2014). There is gap in research findings regarding the positive effects of remittances in general and its effect on economic growth in particular (Ratha, 2013).

Though there are several research findings on the effect of remittances on micro and macroeconomic outcomes in Africa, they could not reach to the same conclusion, i.e. several studies show mixed results regarding the relationship between economic growth and remittance receipt (Ncube and Brixiova, 2013; Singh et al., 2009; Yaseen, 2012; Ratha, 2013; UNCTAD, 2011). That mean that the results are not consistent in that some assert that remittance flow has negative impact on economic growth in the continent (Chami, et al. 2003, Singh, et al., 2009; Spatafora, 2005) and others confirm that it has positive influence (Faini 2002, 2003 in Bangan and Sahu, 2010; Afaha, 2013). Moreover, few researches have been conducted so far in relation to the effects of remittance and poverty reduction (Spatafora, 2005; UNCTAD, 2011) So this paper tries to contribute some empirical findings based on panel data analysis from two major regions of Africa (Eastern and Western). Moreover, studies considered different number of countries in Sub-Saharan Africa. However, there is a tendency for economic integration in African regions, considering region wise effect may give better understanding the effect as well as designing appropriate policy towards migrant remittance inflow. The two regions are selected because of two reasons. First, majority of the remittance sent to Sub-Saharan Africa goes to West Africa (for instance Nigeria takes about 66.7% or about $21 billion) and East Africa contains economies among the ten top receivers of remittances and some of East African countries registered rapid growth in terms of remittance as percentage of their respective GDP. Second, the two economic regions are the largest with respect to the number of countries and population size. This shows that when one studies about these regions, she/he studies much of the issues in Africa.

1.3 Objectives of the study

1.3.1 General objective

The general objective of the research is to analyze the effects of personal remittances in Eastern and Western African countries on economic growth, specifically focusing on addressing:

- To describe the role that personal remittance plays in improving current accounts balance.

- To examine the effect of remittance on the GDP growth rate in both regions.
- To compare the effect of personal remittances in Eastern and Western African countries.

The rest of this the paper is organized as follows. Section two contains the theoretical and empirical frameworks from the available related literature. It is followed by section three (methodology) under which descriptive of study regions, types and sources the data employed and the techniques of data analysis are included. Section four is devoted to the analysis, results and interpretations (discussions). The fifth section is dealt with the conclusions that are derived from the analysis and recommendations.

2. Related Literature Review

This chapter is devoted for reviewing the related literature both from theoretical including the concepts and empirical viewpoints. It started with some definitions and concepts of terminologies, proceeds with theoretical explanations and empirical findings.

2.1 Theoretical Framework

Remittance has influence on various macroeconomic variables such as long run economic growth, consumption, income distribution, real exchange rate, external balance, debt reduction via widening the tax base, poverty reduction and absorbing shocks. According to several economic scholars, remittance affects the economy via enhancing saving, creating fund for investment, initiating growth, consumption, poverty reduction and improving income distribution (Addison, 2004;Ghosh, 2006; Goschin, 2014). There are 2 theoretical approaches to address the question that why migrants send a portion of their respective earnings back home. The first one is family (altruism or attachment with family and relatives) reasons that motivate migrants to remit money to their family living at home. The second is the portfolio approach arising from the desire by migrants to spend their income on investment at home (Goschin, 2014).

2.1.1 The Effect of Remittance on Economic Growth

Regarding the impact of remittances on economic growth, arguments are still hot and did not reach conclusions. Theoretically, the influence on economic growth may be expected to be related by the following link. Remittance influence positively the economic performance either by rising consumption level (enhancing the demand side) or increasing the production via its role promoting saving and investment (i.e. supply side effect) (Goschin, 2014). The positive effect may emerge from:

1) When an increase in remittances promotes investment on both physical and human capital, remittances increase the productive capacity of the recipient economy. This augments production and hence long run economic growth (Goschin, 2014; Singh, et al., 2009).

2) In case if remittance is spent for consumption expenditure rather than investment, its effect on economic growth may be limited. But even in such a situation, remittance may increase market for domestic products (i.e. stable consumption) and hence induces domestic investment resulting in better economic growth (Ghosh, 2006; Goschin, 2014; Singh, et al., 2009).

The negative consequence of remittance on economic growth comes via its effect on appreciation of real exchange rate in receiving economy that reduces export and increases import. So it affects the long run economic growth negatively. Furthermore, remittances may reduce supply of labor and/or participation rate ("*moral hazard*") (Chami, et al. 2003; Singh, et al., 2009). However, as remittance is not broadly distributed, its effect on the exchange rate appreciation is limited (Glytsos, 2002; Simplicio, 2015). Both the negative and positive effects are explained in Ahoure (2008). The negative impact comes from reduction in the competitiveness of economies due to the harmful consequences of remittances on the exchange rate. This raises trade deficit. As a result, remittances influence economic growth negatively. It is because remittances create dependence and discourage labor supply and hence productivity will decrease. On the other hand, when migrants come back home, they bring entrepreneurial skill, the latest technologies, investment capacities and promotion of commerce concepts, which all increases production and competitiveness.

Now the question left unresolved is whether the negative or positive effect outweighs, particularly in developing economies like Africa. The theoretical literature doesn't give conclusive explanations regarding the magnitude and direction of remittances on growth. (Singh, et al., 2009) Remittances increase national income by providing foreign exchange, enhancing saving, investment as well as increasing access for foreign currency. The provision of the foreign finance improves the current account portion of the balance of payments (BOP). (Addison, 2004) This is because migration is considered as man power exporting (Afrin, et al. 2012).

2.2 Empirical framework

2.2.1 The Effect of Remittances on Economic Growth

The empirical findings, in relation to impact of remittances on economic growth, showed positive by some scholars and negative by others (Ahoure, 2008).

According to Fayissa and Nsiah (2008), there is a continued debate regarding the determinants of economic growth [as it is a necessary condition for economic development (Todaro and Smith, 2012) in developing nations. The factors brought in to the discussion table thus far were labor, physical capital, technological progress, aid, foreign direct investment (FDI), human capital, research and development, and the functioning of the political system (institutional factors). However, in many developing nations remittances account for larger inflow of capital even to the extent that remittances exceed FDI, development aid and export earnings. Yet remittance grows faster than FDI and aid. To what degree will economic growth change when remittance changes by a percentage point? This is a key question to be addressed. They found out

that remittance has positive and statistically significant effect on GDP per capita of the countries studied.

Balde (2010), using OLS and 2SLS (instrumental) estimation methods for 37 and 34 SSA sample countries on the effect of remittances on saving and investment respectively, found that remittances are more effective in promoting saving and investment as compared to foreign aid. The coefficient of remittance has been found to be 6-7 times larger than that of foreign aid. When remittances grow by 10%, saving and investment rise by 7% and 6.5% in order of their appearance where as when foreign aid increases by 10%, saving increases by 1.6% and investment by 1%. Simplicio (2015) using studied ARDL bounds testing econometric method based on multivariate co-integration with in an error correction model. The aim of the paper was to determine the short run and long run effects of remittances on economic growth in Cameroon (1960-2014). The findings showed that remittance and economic growth have long run association (i.e. they are co-integrated) and in the short run remittances affect economic growth positively and significantly. Since it increases national disposable income remittance initiates growth.

Siddique et al. (2010),using VAR model on a time series data (25 years) and Granger causality test, found different results for 3 economies in Asia (Bangladesh, India and Sri Lanka). For Bangladesh, the result showed that an increase in remittances doesn't significantly affect economic growth. In India, there was no causal relationship between remittance growth and economic growth. on the other hand for Sri Lanka two way relationship has been found, economic growth promotes growth of remittances and vice versa.

Singh, et al. (2009) found that the effect of remittance to GDP ratio per capita on economic growth is statistically significant and negative, i.e. the expected growth enhancing effect of remittance is questioned.

2.1.2 Remittance and Its Multiplier Effect

Remittance inflow has not only growth effect but also it generate a multiple of impact on income. For instance, Banga and Sahu (2010) found that a unit of USD sent to Mexico has an estimated minimum size of $2.76. To show multiplier effects, Glytsos (2002) used a model which reflects the comparative impact of remittances on macroeconomic variables and the variation of such effects over time (i.e. a dynamic form of Keynesian view) with 3 behavioral equations namely: consumption function, investment function and national income identity. He tried to determine the short and long run effects of remittance by considering it as exogenous shock on the endogenous variables (i.e. to see the induced effects of remittance on economic growth).According to this research, the multipliers of remittance (i.e. its short run effect) range from 0.95 in Egypt to 4.06 for Greece. In case of the long run multipliers, the range goes through 1.5 for Egypt to 4.06 in Greece.

2.1.3 The Role of Remittance on the Balance of Payments

Glytsos (2002) consider that migration represents labor exporting. According to him, Egypt received remittance that exceeds the total of revenues from oil export, Suez Canal dues and tourism. For several developing economies remittance is an important source of external finance (Pradhan, et al. 2012; Paderanga, 2010; Simplicio, 2015).

Remittances are less in terms of cost and are stable sources of external finance in the management of the current account of the BOP (Pradhan, et al. 2012).Using vector error correction (VEC) model these researchers found out a significant and positive relationship between remittance growth and current account balance improvement.

3. Research Methodology

3.1 Description of Study Regions

The study has been conducted in Eastern and Western regions of African countries. Eastern Africa contains 19 countries of Africa, including small Islands, (Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mayotte, Mozambique, Reunion, Rwanda, Seychelles, Somalia, Tanzania, Uganda, Zambia and Zimbabwe). It accounts for 33.47% of the African population (405,478,468 out of 1,211,382, 613).

Western Africa contains 17 countries (Benin, Burkina Faso, Cape Verde, and Cote d'Ivore, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Saint Helena, Senegal, Sierra Leone and Togo). It is home for 29.95% of the African population (i.e. 362,805,216 out of 1,211,382, 613). Together, the regions account for 63.42% of the continent's population (i.e. 768,283,687). For this study, 14 East African and 15 West African countries in total 29 countries are included.

3.2 Data Type and Source

A panel data from 29 nations covering a period from 2000-2014was collected from secondary sources to this study. The data was collected from the World Development Indicators (WDI, 2016 and 2017 various updates), freedom house (www.freedomhouse.org), WIID. With regard to the variables of interest for which data was collected, personal remittance, total population, GDP, FDI, net official development assistance, current account balance, poverty head count, and other related variables were considered.

3.3 Method of Data Analysis

In this thesis, both descriptive and inferential analyses techniques were employed. Using descriptive analysis, the researcher tried to show the role of remittance on balance of payments (current accounts balance), and using inferential analysis (econometric estimation method) the paper estimated the direction and extent of influence of remittances on GDP growth rate and poverty reduction applying the equations below.

3.3.1 Model Specification

The basic framework of panel data models is

$$y_{it} = \beta_0 + X_{it}\beta + u_{it} - (1);$$

Where β represents vector of coefficient parameters, X_{it} refers to the vector of explanatory variables for country I at time t, y_{it} represents the dependent for country I at time t, β_0 is the intercept term and u_{it} the error term (assumed to be normally distributed)

For estimating the model using fixed effects we assume that coefficient parameters remain constant across individuals and the individual specific and time invariant heterogeneity (unobserved variation across individuals) , which can be correlated with the covariates, is assumed to be captured by the intercept parameter. So the model becomes:

$$y_{it} = \beta_{0i} + \beta_1 x_{1it} + \beta_2 x_{2it} + - - - + \beta_k x_{kit} + u_{it} - (2)$$

NB: here β_{0i} has not subscript "t" as it is assumed to be time invariant and individual specific variation but the individual specific differences are assumed to correlate with the covariates.

To estimate random effects individuals are assumed to be selected randomly and hence the individual variations captured by the intercept are random. This can be considered as normally distributed random error. In such a case the intercept term is composed of the fixed that represents the population average and the random part. It is stated as:

$$\beta_{0i} = \beta_o + \varepsilon_i - (3)$$
$$y_{it} = \beta_0 + \beta_1 x_{1it} + \beta_2 x_{2it} + - - - + \beta_k x_{kit} + (\varepsilon_i + u_{it});$$
$$y_{it} = \beta_0 + \beta_1 x_{1it} + \beta_2 x_{2it} + - - - + \beta_k x_{kit} + v_{it} - - - - - - - - - - - - - - - - - - (4)$$

Here v_{it} contains the individual and the random (idiosyncratic) components of the error. Here the individual variation is assumed not correlated with the explanatory variables. (Gujarati and Porter, 2009 pp 591-602; Hill and Griffiths, 2011 pp 543-553; Wooldridge, 2013 pp 486-497)

For each region, the first model adopted from Fayissa and Nsiah (2008), Ahoure (2008) and Yaseen (2008)

$$lnGDP_{it} = \beta_0 + \beta_1 lnRem_{it} + \beta_2 lnODA_{it} + \beta_3 ToT_{it} + \beta_4 lnfdi_{it} + \varepsilon_{it} - - - - - - - (5)$$

Where; all in natural log

$lnGDP_{it}$ = the natural log of GDP in current USD for country "i" at time "t"

$LnRem_{it}$= the natural logarithm of personal remittance received in current USD for country "i" at time "t"

lnODA =the natural log of net official development assistance to capture the effects of overseas development assistance in current USD for country "i" at time "t".
ToT = the terms of trade for each nation of the respective regions under discussion (i.e. the ratio of export value index to import value index) to capture the impact of international trade or openness of the economy on economic growth.
$lnfdi_{it}$ = the natural logarithm of foreign direct investment

The same equation is also estimated in per capita terms just by converting the variables into per capita values.

3.4 Diagnostic Tests

Before estimating is undertaken, panel data unit root test is conducted to check whether the data for each variable is stationary or not. To check the existence of any correlation between the error component (u_i) and any of the explanatory variables a **Hausman test** (with asymptotic $\chi 2$ distribution) was applied. This test can be carried out for specific coefficients, using a t-test, or jointly, using an F-test or a chi-square test. It helps one to decide whether fixed effect or random effect model is appropriate estimation mechanism. (Gujarati and Porter 2009: p603; Hill, Griffiths and LIM, 2011:p558).

A test developed based on Lagrange Multiplier called the **Breusch-Pagan statistic** was used to check whether pooled regression (simple OLS) or random effects model is the appropriate to come up with the more efficient and consistent coefficient estimation (Gujarati and Porter 2009: p 605; Hill, Griffiths and LIM, 2011: p554; Wooldridge, 2002: p264).

4. Results and Analysis

4.1 Introduction

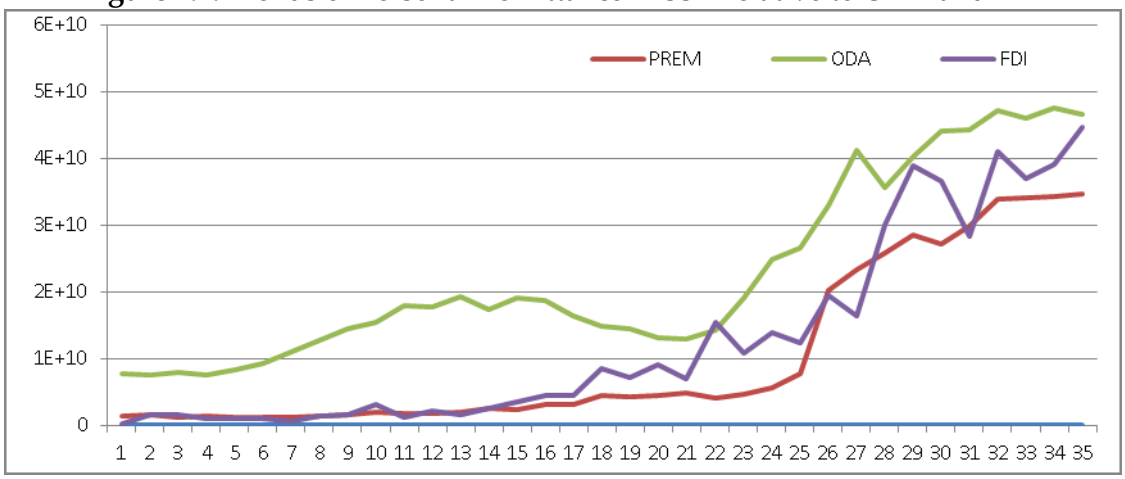
In this section, the focus is on analyzing the role that personal remittance (as a flow of foreign currency from abroad) can play in improving the current account component of the balance of payments, enhancing economic growth and poverty alleviation. The first part covers the descriptive aspect particularly devoted for describing the effect of remittance on improving current accounts balance. The second section deals with the inferential analysis to see the effect of remittance on economic growth and poverty reduction with comparison in this effect between the two regions.

4.2 Descriptive Analysis

Sub-Saharan Africa which comprises of 44 countries is located below the Sahara desert and is considered as the poorest region in the globe for the last several years though there are hopes of revival in recent few years. While for the last 55 years (1960-2015) per capita income (measured by per capita GDP) in SSA has grown on average only by about 0.83%, nominal GDP has grown by about 3.57% on average during same time period. Of course, the growth rate in both cases was not consistent throughout the period, i.e. sometimes negative on other time positive. In the recent 16 years (2000-2015) SSA has scored positive growth in both per capita and nominal GDP, i.e. on average

2.24% & 5.04 % in order of their appearance. Per capita income has grown from 118.62 USD in 1960 to 1571.33 in 2015 by about 13 fold. Total population in the region has grown on average by 2.72%, which over passed a billion (1000980981) in 2015 from 228,268,752 in 1960, i.e. approximately by 4.4 fold. Sub-Saharan Africa has 23.2 million, which is about 2.5% of the total population, migrant stock and its size is increasing over time. Arising from this, personal remittance is increasing in the region. For instance, from 1970 to 2015 personal remittance in the region has grown on average by 21.58% which reached 37,407,484,393.90 USDfrom 22,659,994.13. This is equivalent to a per capita income of 37.37 USD, i.e. about 2.38% of the per capita income in the region is contributed from personal remittance during 2015. Now is time to see the relative trend of GDP personal remittance (PREM), net official development assistance received (ODA) and foreign direct investment (FDI) covering the period from 1980-2014.

Figure 4.1: Trends of Personal Remittance in SSA relative to ODA and FDI



Source: own calculation based on WDI.

In Sub Saharan Africa though net official development assistance remained above both FDI and PREM throughout 1980-2014, it fluctuates more than PREM. FDI, as expected from both theory and empirical findings is more volatile than both PREM and ODA, i.e. it turns up and down every now and then which one can easily observe from the figure above. PREM is smaller than both the other variables but it is relatively stable over time as well as it grows faster than them particularly after 2003. The reason for the relative high volatility of FDI and ODA can be traced back to their nature. Decision makers of FDI are foreigners motivated for profit. When the region experiences war, drought and other crisis (indeed it is prevailing fact), FDI flights out since the region might not generate enough profit. ODA may fluctuate due to the various pre-conditions that donors set and which may be beyond the capacity of the recipient economies in addition to the global (external) economic and political environment. The lest volatility of personal remittance as compared to its counter variables matches with other research findings such as Pradhan A.H. et al. (2012).

The target study countries are located in two sub-regions (15 in the West and 14 in the East nations totaling 29) of the Sub Saharan Africa.

The magnitude of international migration is increasing from year to year perhaps caused by relative international openness, conflict and war, poverty (the prevailing large income gap as incentive to migrate), natural calamities and disaster, etc. Within 15 years it has grown by about 42.9% (from 175 million in 2000 to 251 million in 2015). Out of the 251 million international migrants, refugees account for about 6% (i.e. 14.4 million). The top ten main destinations of global migrants are USA, (46.1 million), Saudi Arabia (14.6 million), Germany (11.1million), the Russian Federation (11 million), the United Arab Emirates (8 million), United Kingdom (7.8 million), France (7.5 million), Canada (7.4 million), Spain (6.6 million) and Australia (6.5 million) comprising 50.4% of the total 251 million international migrants (MPI, 2016; (World Bank Group fact book 2016; World Bank Group brief April 2016).

According to MPI (2016) estimation, out of the total international migrant stock, the percentage share of the countries included in this study was about 5.6% (i.e. 13,932,088 out of the 251 million total) during 2015 (NB: it includes the bilateral migration among these nations themselves). The main destinations for the migrants of these countries are USA (988284), Canada (186187), Germany (127133), France (628803), UK (772950), South Africa (1 312633), Spain (182560), Saudi Arabia (164678 of which 150,000 are Ethiopians), Italy (280518), Portugal (173299), Australia (128858).

Following this migrant stock, a total of 32.951 billion USD personal remittance inflows in to these countries was estimated though majority (about 62.9%) of it goes to Nigeria (once again bilateral remittance flow is included here).

In terms of remittance to GDP ratio Comoros (from East Africa) is ranked number one by receiving on average 17.58% of its GDP during 2004-2014. The next seven ranks are taken by the Western countries namely: Liberia (13.53%), Gambia (12.09%), Senegal (10.38%), Cape Verde (10.19%), Togo (9.7%), Nigeria (7.33%), and Guinea-Bissau (5.22%). The amount of remittance received by the remaining countries is below 5% of their respective GDP (please refer to table C1 in the appendix C). From this we can understand that Eastern African countries receive less remittance as compared to their GDP. The next higher remittance to GDP ratio receiver in the Eastern African countries is Uganda (3.97%). The bottom 6 countries (including Ethiopia) in this ranking belong to the East sub-region and receive less than 1% of their GDP. Taking the 2015 data among the top ten remittances recipient countries in Sub Saharan Africa, Eight are included in this study. These are Nigeria (USD 20.8 billion), Ghana (USD 2 billion), Senegal (USD 1.6 billion), Kenya (USD 1.6 billion), Uganda (USD 0.9 billion), Mali (USD 0.9 billion), Ethiopia (USD 0.6 billion) and Liberia (USD 0.5 billion).

4.2.1 The effect of Remittance on Current Account Balance

Since remittance flow is part and parcel of the current account balance – as international transfers (Afrin et al. 2012; Heijdra, p258, Padranga, nd)-, let me focus on the effect of personal remittances on the current account balance (i.e. to see its effect on the balance of payments, it is important to show its role on improving the current account balance). Taking current account balance data for the target countries from the World Bank WDI data, one can see that from 2000-2014 most of these nations had negative balance in

their current accounts. More or less the exceptions were Gambia, Djibouti, Nigeria and Mauritius.

Djibouti had positive CA balance up to 2006 after which it culminated in to negative balance but in 2010, it got back positive balance. In the case of Gambia, in 2003it was positive, from 2004-2007 it showed negative current accounts balance and from 2008 to 2012 Current account balance turned back to positive. Thus, it shows more fluctuation. Nigeria had positive current account balance throughout the study period except during 2015. Mauritius had positive balance only from 2001-2003 having negative balance for the rest of the years. Ethiopia showed positive balance only during 2000. Now let's see the contribution of personal remittance on improving the current account balance. First, let's see what the trend was in personal remittance for the economies that had positive balance in their current accounts. The largest personal remittance receiver among the target counties as well as in SSA as a whole is Nigeria. From 2000-2015 personal remittance in Nigeria has grown approximately 9.03%. If we compare this remittance growth with the per capita economic growth rate and growth rate of current accounts balance of this nation, we get the following information. On average when personal remittance grows by 9.03%, current accounts balance improves by 7.45% and per capita GDP grows by 7.06% in Nigeria.

The possible reasons for the growth of personal remittance over time could be one or more of the following. First of all cost of transfer has significantly declined and the easiness for money transfer got great improvement though still efforts are being made but relatively the cost is highest in Sub-Saharan Africa , which 9.5% (World Bank Group fact book, 2016). The application of some new technologies- for instance, mobile banking- that made money transfer easy, faster and less costly getting expanded in Africa (Siegel and Fransen, 2012). Secondly, world income in general and the developed world in particular –where majority of migrant workers live and work- has increased and hence migrant workers earn more than before that enhanced their capacity to send back home a portion of their respective income. Third, the number of migrant workers from these countries has increased to a large extent (World Bank Group fact book, 2016). The cause for the increment of migration has been given by different empirical works. As an illustration, Wong and Celbis (2015) the growth of migrant workers is mainly caused by differences in political freedom and income levels between the country of origin and the rest of the world. Moreover, there is measurement improvement of remittance flow (World Bank Group fact book, 2016). Total size of personal remittance (PREM) and current accounts balance (CA) in the study countries from 2000-2014 is presented below in table 4.1.

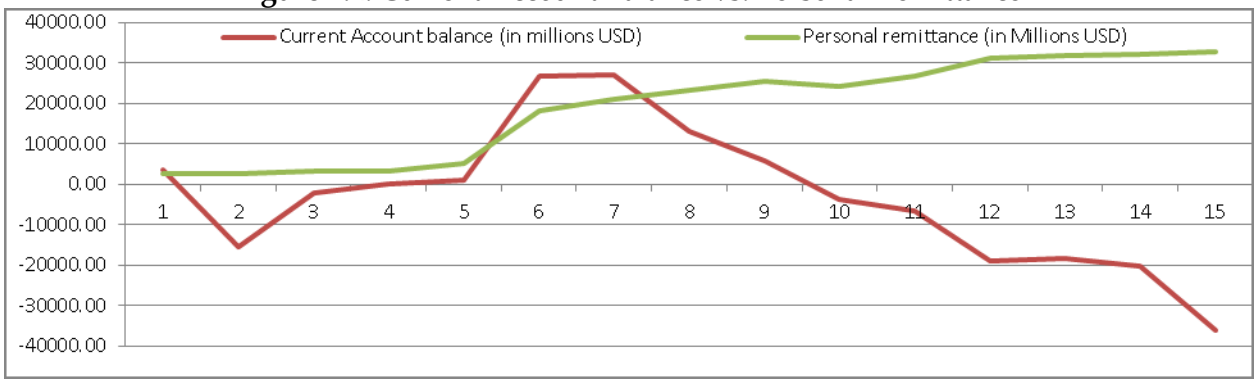
Table 4.1: Current Account Balance vs. Personal Remittance 2000-2014 in target Countries

Year	Current Account balance (in millions USD)	Personal remittance (in Millions USD)	Percentage growth rate of remittance
2000	3,658.26	2,693.14	
2001	-15,391.43	2,778.89	3.184016
2002	-2,056.39	3,119.34	12.25129
2003	231.69	3,347.26	7.306674
2004	1,120.44	5,198.91	55.31838
2005	26,735.88	18,127.63	248.6814
2006	27,064.30	21,110.33	16.45389
2007	12,951.29	23,299.28	10.36909
2008	5,826.97	25,397.32	9.004742
2009	-3,563.48	24,339.60	-4.16469
2010	-6,603.67	26,727.95	9.81261
2011	-18,903.53	31,076.26	16.26877
2012	-18,445.72	31,882.29	2.593716
2013	-20,337.48	32,125.53	0.762931
2014	-36,064.23	32,730.00	1.881588

Source: own summation from WDI.

As can be observed from the table 4.1, though personal remittance has grown by a large extent relative to the growth rate of other factors such as FDI, ODA, GDP, and GDP per capita the current accounts balance continued to deteriorate. This is particularly true in most recent years. Though it started with positive balance (surplus CA) current accounts, it started sustained deterioration since 2009 and hence the gap between the two continued diverging. What is the potential reason for the onset as well as the continuation of the deterioration? The onset of the negative CA balance may be due to the world financial/economic/ crisis, which implicated even personal remittance to decline by about one billion UDS as compared to the year 2008. The continuation of the deterioration may result from other factors such as a decline of export price of primary products in the world market say oil price declined which affects the Nigerian and Ghanaian current accounts balance and other agricultural and mineral prices. The divergence between remittance and current accounts balance is depicted below in figure 4.2.

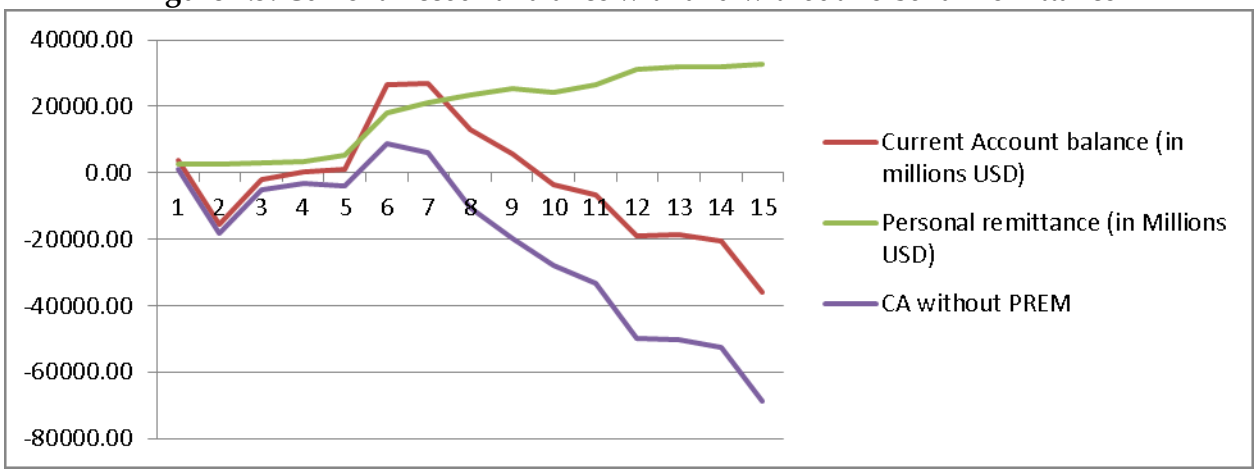
Figure 4.2: Current Account Balance vs. Personal Remittance



Source: Own computation from WDI

Here, one can see that what would have been the status of the current accounts balance without personal remittance receipts. Let's resolve this question by deducting the personal remittance magnitude from the current accounts balance magnitude. When we isolate the personal remittance component from the current accounts balance, we can see the what would be the picture there in. based on the data available from 2000 to 2014, the current accounts balance after personal remittance deducted is displayed below. The gap between current account without personal remittance and the current account curve represents the size of personal remittance. It is indicated in figure 4.3 below. This implies that it gauges the extent that it has improved the current accounts since if there were no personal remittance inflow the current account balance in the study countries together would have been further deteriorated (the deficit would have been larger than the observed ones).

Figure 4.3: Current Account Balance with and without Personal Remittance



Source: own diagram using Excel

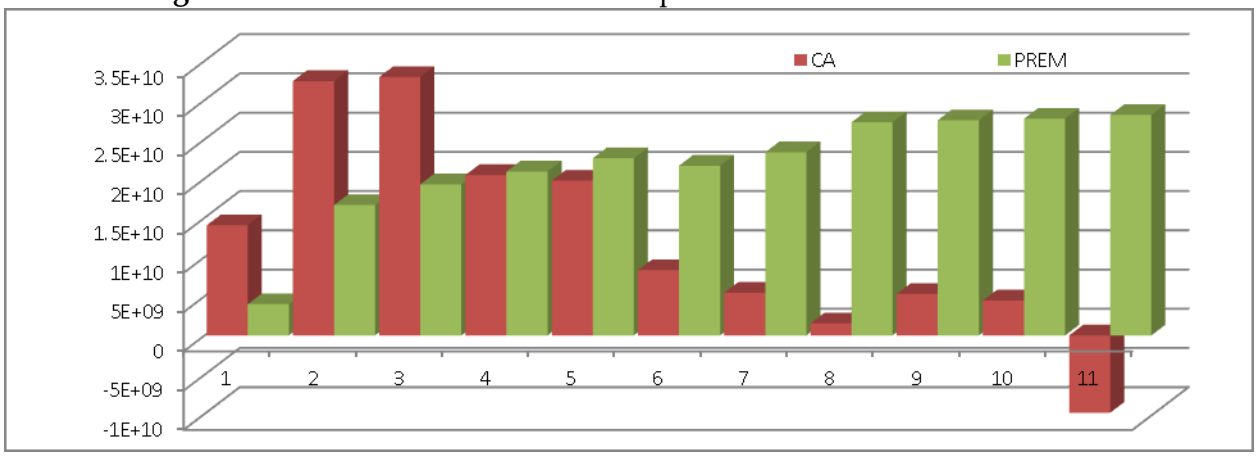
This result is comparable with the findings of Pradhan A.H. et al (2012) which concluded that remittance improved the current accounts balance component of the balance of payments in Bangladesh as factor income from the rest of the world. Suppose there were no remittance flows at all to these countries. The consequence would be that the countries would have to search other options to fill the deficit by the amount of the remittance. This can be either from foreign direct investment or development assistance or else borrowing. But foreign direct investment could not grow as per the demand from the less developed countries. The development assistance has its limitations and borrowing is also very difficult as well as costly at repayment of the principal with the interest. This implies that by improving the current accounts balance personal remittance is playing a significant role to the countries in question to reduce their potential debt burden.

4.2.2 Comparison between the two Regions

As can be observed from figure 2.4 below, countries that belong to Western Africa together have positive current accounts balance from 2004 to 2013 but negative during the year 2014 though its magnitude shows a declining trend. Of course, this size is

highly influenced by the Nigerian economy which has larger current account surplus balance.

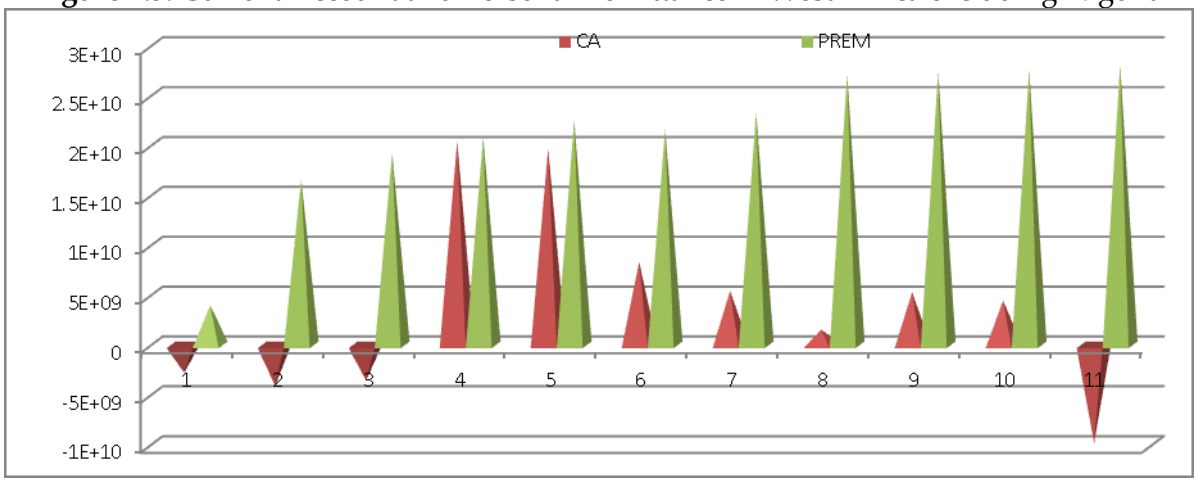
Figure 4.4: Current account balance vs. personal remittance in West Africa



Source: own description using excel from WDI

When we pick out the Nigerian current account balance to get the balance of the other countries in the sub region, we will see a different image. With reference to figure 4.5 in the next page, for the first three years (2004-2006), the current account balance for the rest of the economies showed deficit (negative balance) and for the next seven years it is positive but remains less than the magnitude of the personal remittance received. In aggregate terms personal remittance is growing in these countries similar to the other cases. In the countries, personal remittance is growing at aggregate level.

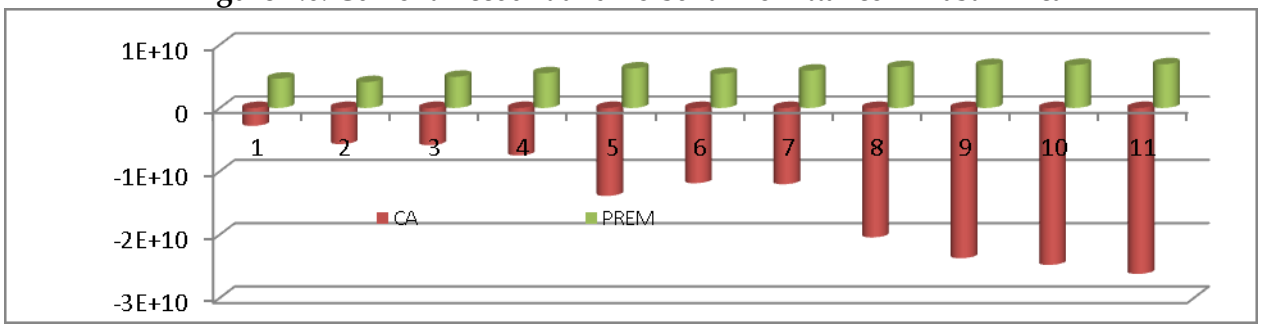
Figure 4.5: Current Account and Personal Remittance in West Africa excluding Nigeria



Source: Own demonstration using Excel

On the other hand, study target countries that belong to the Eastern Africa have deficit current accounts balance with deteriorating trend. The deficit continued to expand whereas personal remittance is growing at stable rate.

Figure 4.6: Current Account and Personal Remittance in East Africa



Source: own diagram using excel from WDI

Before proceeding to the inferential analysis, the correlation between the dependent and independent variable and the summary description is presented below.

4.3 Inferential Analysis

4.3.1 Panel Data Unit Root Test

Table 4.1: Panel data Unit root test for the variables that will be used in the regression

Variable name	Unit root test type	Unadjusted t-value	adjusted t-value	p-value	Remark
Lnrem	Levin-Lin-Chu	-9.3166	-4.3640	0.0000	Stationary
Lngdp	Levin-Lin-Chu	-8.0631	-6.9210	0.0000	Stationary
Lnoda	Levin-Lin-Chu	-15.4243	-12.1058	0.0000	Stationary
TOT	Levin-Lin-Chu	-9.7842	-5.0794	0.0000	Stationary
lnfdi	Fisher-type unit-root test for lnfdi (**since it is unbalanced data**)	Inverse chi-squared(58) P	95.5270	0.0014	Stationary
		Inverse normal Z	1.6337	0.0512	
		Inverse logit t(144) L*	-1.9918	0.0241	
		Modified inv. chi-squared Pm	3.4843	0.0002	

Source: Own computation

From table 4.3 above, one can observe that the variables that are used in the regression are stationary using Levin-Lin-Chu for the first four variables and Fisher-type unit-root test for Lnfdi because it contains unbalanced data.

4.3.2 The Effect of Remittance on Economic Growth

As we can observe from the regression result table of five models in Appendix A (table A1), the size, direction of the influence and significance of the coefficients, the growth of personal remittance (Lnrem) of has positive coefficient parameter irrespective of the five models. It is as expected from theory and some of the empirical findings. Whether we adopt pooled regression or population average or between estimation or fixed effect or random effect estimation mechanism, it is positive. Also, it is significant at 5% in one and 1% in four of the models (pooled regression, population average, fixed effects and

random effects). In terms of size of the coefficients, the difference among four of the models: pooled regression, population average, fixed effects and random effects is not large. But coefficient is very large.

The standard deviation of the individual specific variation (heterogeneity) - sigma_ui- is much greater than the standard deviation of the idiosyncratic error component of the composite error term. In fact, sigma_ui (1.064) is about 4.3 times that of sigma_e (0.250). The value of rho, as it represents the proportion of variation due to individual specific part of composite error, is very large (0.94). It implies that 94% of the variation in the composite error is caused by individual unobserved differences (factors) and hence not due to idiosyncratic component of the composite error.

The within R^2 measures the time variation within the individual mean. Thus, as time changes GDP changes by 49.7%using the between estimation technique, by 55.2% using 3 models, i.e. fixed effect, random effect model & pooled regression.Therefore, remittance causes the GDP to grow over time but it doesn't cause economic growth to vary across (between) countries. It just affects the GDP to grow over time but not to differ among the target study economies.

In a similar fashion, the growth of net official development assistance (lnoda) has positive and statistically significant effect on the growth of GDP (lngdp) except in case of the between estimation model. FDI growth has positive and significant coefficients for all of the models though it varies a bit in magnitude. Its effect ranges from 0.130% per percentage change in FDI in the fixed effect model to 0.166% per percentage in the between model. Terms of trade though has positive coefficient, its effect on economic growth in these countries is statistically significant in neither of the models.

The average intercept value ranges from 12.493 for the between model to 14.13 for the pooled and random effects estimation and it is statistically significant in all of the cases at 1% significance level. Here, the individual intercepts are not displayed in the table since it would have been a large list of 29 individual countries. The question that one need to resolve next is which of the models is appropriate on the basis of which the interpretations and hypothesis testing will be made.

Table 4.2: Hauseman and LM test for effect of remittance on Growth

```
. hausman FIXED RANDOM

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |    FIXED        RANDOM       Difference          S.E.
-------------+----------------------------------------------------------------
       lnrem |   .1431466      .146858      -.0037114        .0039643
       lnoda |   .1816776     .1605153       .0211623        .0166505
       lnfdi |   .1300318     .1336493      -.0036175        .0051951
termsoftrade |   .0517843     .0509084       .0008759        .0022774
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =          4.68
                Prob>chi2 =        0.3222
```

```
Breusch and Pagan Lagrangian multiplier test for random effects

        lngdp[country,t] = Xb + u[country] + e[country,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                   lngdp |   2.122502       1.456881
                       e |    .062309       .2496177
                       u |   1.132407       1.064146

        Test:   Var(u) = 0
                                 chibar2(01) =  1347.26
                              Prob > chibar2 =   0.0000
```

Source: Own computation.

As the table of the Hausman table 4.4 above indicates that the probability of $x^2$is 32.22% which is much greater than 5% implying that in comparison with fixed effects model, random effects is appropriate to estimate and interpret the effect of remittance on economic growth. This means that the difference in coefficients between the two models is insignificant. Similarly, LM test (under the same table) shows, the probability of the x^2 is less than 5% i.e. (0.0000<0.05), the appropriate model is random effects because the LM test has indicated that it is statistically significant evidence regarding the existence of panel effects.

Thus, the interpretation of the coefficients and related findings is made based on random effects model. The random effect estimation results are given in table 4.6 below. To overcome the possible heterosedasticity problem, robust standard error estimation (error adjusted cluster regression) is applied for the random effects model. As can be observed from the table all the coefficients of the variables as well as the constant term are significant at 1% level of significance.

Table 4.3: Random Effects Model Estimation Results Growth Effects of Remittance

```
Random-effects GLS regression                   Number of obs      =       314
Group variable: country                         Number of groups   =        29

R-sq:  within  = 0.5516                         Obs per group: min =         7
       between = 0.4394                                        avg =      10.8
       overall = 0.4457                                        max =        11

                                                Wald chi2(4)       =    167.16
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 29 clusters in country)
```

lngdp	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnrem	.146858	.0566553	2.59	0.010	.0358155	.2579004
lnoda	.1605153	.0533371	3.01	0.003	.0559765	.2650541
lnfdi	.1336493	.0223675	5.98	0.000	.0898097	.1774889
termsoftrade	.0509084	.0112555	4.52	0.000	.028848	.0729689
_cons	14.13012	1.107163	12.76	0.000	11.96012	16.30012
sigma_u	1.0641463					
sigma_e	.24961766					
rho	.94784621	(fraction of variance due to u_i)				

Source: own computation

On average of the overtime and across nations, ceteris paribus, when personal remittance increases over time and across countries by 10%, it causes GDP to grow approximately by about 1.47% (to be more exact 1.46858%). When net official development assistance increases by 10%, economic growth increases by about 1.61% and as foreign direct investment increases on average both within and between, keeping other factor constant, by 10%, GDP grows by 1.34%. From this, one can see that remittance has more growth impact relative to FDI and less effect as compared to net official development assistance. When the terms of trade improves by 10%, the economy grows marginally by about 0.5%.

4.4 Hypothesis Testing

The students t-statistical values test the hypothesis that each of the parameters/ coefficients/ is different from zero. The null hypothesis being that each one is zero. For 95% level of confidence, if t-value is greater than the absolute value of 1.96 for large sample, it will lead to the rejection of the null hypothesis that parameter is zero (i.e. statistically speaking it is not significantly different from zero). Based on the t-value, one can conclude from the above table that growth of remittance (natural logarithm), net official development assistance, and foreign direct investment and terms of trade are significant all having z-values of greater than the absolute value of 1.96.

The coefficients of the natural logarithms of remittance, net official development assistance, terms of trade and foreign direct investment are significant at 1% level of significance. Therefore, all the variables considered are statistically different from zero

in both by z-value and p-value. The intercept parameter is positive (= 14.13 units) is significant at 1%.

The overall model (i.e. the effect of all the parameters together) is significant as witnessed by the probability of chi2 which is less than 5%. Since the within R^2 refers to the variation within the panel units (countries in our case), about 55.16% of the variation in economic growth is due to the factors within each of the countries (time variation). Whereas the between $R^2$43.94% measuring the variation between groups of panel units (among countries) and the overall R^2 (the weighted average of the two) is 44.57%. The proportion of the individual effects variation is approximately 94.78%, i.e. about 94.78% of the variation in the composite error is due to the individual specific effect.

4.4.1 The Effect of Per Capita Remittance on Per Capita Income

Based on Hausman model specification test and LM test (Table 4.7 below), random effect estimator was found to be the appropriate to estimate the relationship between remittance per capita on income per capita. For resolving the potential heterosedasticity, robust random effect estimation for the 29 cluster (countries) is undertaken.

Table 4.4: Hausman and LM test for remittance effect on per capita GDP growth

```
. hausman FIXED RANDOM
```

	Coefficients (b) FIXED	(B) RANDOM	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
lnremperca~a	.1115895	.1136168	-.0020273	.0041851
lnodaperca~a	.1049709	.0853297	.0196412	.0170608
lnfdiperca~a	.110684	.1109265	-.0002425	.0052767
termsoftrade	.0464738	.045333	.0011409	.0027506

```
                b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =          1.79
                Prob>chi2 =        0.7735
Breusch and Pagan Lagrangian multiplier test for random effects

        lngdppercapita[country,t] = Xb + u[country] + e[country,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+------------------------------
                lngdppe~a|    .9010917       .9492585
                       e |    .0491753       .2217549
                       u |    .6915161       .8315744

        Test:   Var(u) = 0
                                 chibar2(01) =  1336.03
                              Prob > chibar2 =   0.0000
```

Source: own computation

With reference totable4.8 below, among the variables included all the variables, i.e. growth in net official development assistance in per capita terms, growth in FDI, improvement in the terms of trade and growth in remittance per capita have positive and statistically significant coefficients at 5% and 1%. Accordingly, a 10% increase in

per capita remittance causes a 1.14% increase in income per capita. On the other hand, a 10% increase in net official development assistance per capita leads the per capita GDP to grow by 0.85%; a 10% growth in FDI causes GDP per capita to grow by 1.12% and a 10% improvement in terms of trade leads to a 0.45% of per capita income growth. Hence, remittance has more growth promoting impact as compared to net official development assistance in per capita values and FDI as well as terms of trade.

Table 4.5: Per Capita GDP Growth Effect of Per Capita Remittance /Random Effects Model

```
Random-effects GLS regression                   Number of obs      =       314
Group variable: country                         Number of groups   =        29

R-sq:  within  = 0.4359                         Obs per group: min =         7
       between = 0.2481                                        avg =      10.8
       overall = 0.2632                                        max =        11

                                                Wald chi2(4)       =    105.40
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                                  (Std. Err. adjusted for 29 clusters in country)
------------------------------------------------------------------------------
             |               Robust
lngdppercapita |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
lnrempercapita |   .1136168   .045319     2.51   0.012     .0247932    .2024405
lnodapercapita |   .0853297   .0396023    2.15   0.031     .0077106    .1629489
lnfdipercapita |   .1109265   .0200507    5.53   0.000     .0716278    .1502252
  termsoftrade |    .045333   .0088821    5.10   0.000     .0279244    .0627415
         _cons |   5.668251   .2277212   24.89   0.000     5.221925    6.114576
-------------+----------------------------------------------------------------
       sigma_u |  .83157445
       sigma_e |  .22175494
           rho |  .93360898   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Source: own computation

4.4.2 Comparison of the Effect on Eastern and Western Countries

In this subsection, a comparison is made regarding any variation about the effects of remittance on economic growth. For this purpose, the estimation models are identified for each group countries based on model specification tests. Finally, the results are compared.

A. Growth Effects of Remittance in East African Countries

Based on the Hausman model specification test (Table A3 in Appendix A) the null hypothesis that individual specific variance are not significant (and hence random effects model is the appropriate) is rejected since the probability of chi-square is <0.05. This means the alternative hypothesis (i.e. fixed effects model is accepted). Thus, the interpretation of the coefficients is made using the fixed effects model. To resolve the possible heterosedasticity, robust standard error (i.e. variance co-variance clustered by country) estimation is used. The result shows that growth in remittance flow to East Africa and terms of trade are significant at 10%. And growth in ODA is significant at 1% and growth in FDI are significant ate 5% level of significance.

A 10% growth in personal remittance causes a 1.21% of GDP growth in East African countries. As ODA grows by 10% in East African countries GDP grows by 4.43% and the growth of FDI by about 1.3%. Therefore, remittance has less growth enhancing effect relative to the other two foreign sources, i.e. ODA and FDI.

Table 4.6: The Effect of Remittance on Growth in East Africa

```
Fixed-effects (within) regression               Number of obs      =       153
Group variable: country                         Number of groups   =        14

R-sq:  within  = 0.6678                         Obs per group: min =        10
       between = 0.2255                                        avg =      10.9
       overall = 0.2395                                        max =        11

                                                F(4,13)            =     10.83
corr(u_i, Xb)  = -0.7814                        Prob > F           =    0.0004

                                    (Std. Err. adjusted for 14 clusters in country)
------------------------------------------------------------------------------
             |               Robust
      lngdp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      lnrem |   .1214067   .0645875     1.88   0.083    -.018126    .2609394
      lnoda |    .443294   .1453716     3.05   0.009     .1292378   .7573502
      lnfdi |   .1295899   .0435325     2.98   0.011     .0355436   .2236362
termsoftrade|   .4865557    .272073     1.79   0.097    -.1012223   1.074334
      _cons |   9.133475   2.497956     3.66   0.003     3.736969   14.52998
------------------------------------------------------------------------------
    sigma_u |  1.9204432
    sigma_e |  .28325808
        rho |  .97870808   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Source: own computation

B. Growth Effects of Remittance in West African Countries

Based on the Hausman model specification test in table (A4 in the Appendix A) fixed effects estimation is found to be the appropriate one. This implies that the interpretation of the coefficients should be made using the fixed effects model. For the sake of resolving the possible heterosedasticity problem robust standard error estimation is applied. As can be observed from table 11 below, the growth in remittance, foreign direct investment, terms of trade and the intercept term are significant at 1% level of significance whereas the growth of ODA is significant at 10%.

When personal remittance in Western Africa grows by 10%, GDP grows by 2.52% where as the effect of ODA on economic growth is that when it increases by 10%, it causes an increase of 1.29% in GDP. On the other hand, when FDI grows by 10%, GDP responds to grow approximately by 1.25% and the same growth in terms of trade has a 0.35% growth effect on the West African economy.

Table 4.7: Fixed Effect Model: Growth Effects of Remittance in West African Countries

```
Fixed-effects (within) regression               Number of obs      =       161
Group variable: country                         Number of groups   =        15

R-sq:  within  = 0.6200                         Obs per group: min =         7
       between = 0.6663                                        avg =      10.7
       overall = 0.6595                                        max =        11

                                                F(4,14)            =    203.76
corr(u_i, Xb)  = 0.3476                         Prob > F           =    0.0000

                                    (Std. Err. adjusted for 15 clusters in country)
------------------------------------------------------------------------------
             |               Robust
      lngdp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      lnrem |   .2519482   .0616964     4.08   0.001     .1196225   .3842739
      lnoda |   .1285972   .0717986     1.79   0.095    -.0253955   .2825899
      lnfdi |     .12476   .0403998     3.09   0.008      .038111   .211409
termsoftrade|   .0347709   .0092312     3.77   0.002     .0149719    .05457
      _cons |   12.74273   .8959992    14.22   0.000     10.82101   14.66446
------------------------------------------------------------------------------
    sigma_u |  .94891946
    sigma_e |  .22991637
        rho |  .94454946   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Source: own computation

C. Comparison

Remittance has less growth enhancing effect in East African countries as compared to the Western counter parts. The effect in the West is almost double that of the East.

5. Conclusion and Policy Recommendations

5.1 Conclusions

In Sub-Saharan Africa, remittance flow is more stable relative to other foreign resources such as net official development assistance and foreign direct investment as it was confirm from the data for the last 15 years. Among the top ten remittance receivers in Sub-Saharan Africa eight are included in this study. However, out of the eight, five are found in the Western sub-region.

In the study target countries, remittance improved the current accounts component of the balance of payments both from all the 29 countries perspective and the regional countries treated separately in their respective regions. The positive current accounts balance in the Western part, for most of the years considered, is due to the performance of the Nigerian economy. In comparison with the Eastern African countries, the Western African countries show more remittance flow and as a result of it they have better current accounts balance.

The implication of remittance to these countries from balance of payments view point is immense. If these countries were not able to receive this remittance their balance of payments would have deteriorated by this amount and to fill the gap they would have forced either to search more borrowing (a burden to the next generation tax payer) or to cut their imports which mainly include capital goods import. This later action would have consequences of reducing the productive capacity of these countries, which ultimately causes the economic performance to be curtailed.

The role of remittance flow is not limited only, on to improving the current accounts balance. Its effect goes further, among others, to the growth of GDP, per capita GDP growth and poverty reduction. Remittance has positive effect on economic growth. Economic growth increases by 1.47% when remittance receipt increases by 10%. But the same percentage increase in net official development assistance leads to only 1.61% impact on GDP growth, greater than effect of remittance by about 0.14. A 10% rise in FDI per capita leads to an increase of 1.34% in GDP and 1.12% growth in per capita GDP. Moreover, a 10% growth in the receipts of per capita remittance causes a 1.14% increase in per capita income. In comparison, however, it has less growth enhancing effect in the Eastern African countries than the Western counter parts. Whereas remittance has 1.44% growth effect in Eastern African countries for every 10% increase in remittance, its effect on growth of GDP in the West African countries is only 2.24% for a 10% rise in remittance.

5.2 Policy Implications

- Since remittance has positive and significant effect on economic performance in terms of GDP growth and growth in per capita GDP, the countries should give due

emphasis in smoothing the flow of remittance by designing mechanisms that reduce cost of transfer perhaps by promoting the use of technology of transfer such as mobile banking and applying policy instruments that ease the transfer and creating good relation with the Diaspora community. However, this doesn't imply that migration should be enhanced. This is because we have not seen here the negative consequences of brain drain.

- As the formal remittance is contributing to the performance of the macroeconomy of these countries, they should work on tackling the problems of the transfer and bring the informal flow back into the formal one so that they would capture the real fruit of the effect there in. The deterrents that could be solved are might be, among others, the divergence in the official and black market exchange rates. This can be solved possibly by adopting flexible (at least managed) exchange rate regime and reducing the cost of transferred charged by the banking system.

References

Addison, E.K. (2004). *The Macroeconomic Impact of Remittances*. Presentation at the conference on migration and development in Ghana

Afaha, Jhon S. (2013). *Migration, remittance and Development in Origin Countries: Evidence from Nigeria.* African Population Studies vol.27

Ahoure, E. (2008). *Remittances, Governance and Growth in Sub-Saharan Africa Countries: A dynamic panel data analysis*. Ininternational migration institute workshop, November (Vol. 26).

Andersson, L. (2012). *Migration, remittances and household welfare in Ethiopia*. *Migration*, 004.

Baldé, Y. (2011). *The Impact of Remittances and Foreign Aid on Savings/Investment in Sub-Saharan Africa*. *African Development Review*, *23*(2), 247-262.

Bell, Andrew and Kelvyn Jones (2015). *Explaining Fixed Effects: Random Effects Modeling of Time-Series Cross-Sectional and Panel Data*. https://www.researchgate.net/publication/233756428

Chami, et al. (2008). *Macroeconomic consequences of remittances*. IMF

Emerta et al. (2010). *International Migration, Remittances and Poverty Alleviation in Ethiopia*. Ethiopian Economics Association (EEA)Ethiopian Economic Policy Research Institute (EEPRI): Working Paper No 1/ 2010

Fayissa, B., and Nsiah, C. (2010). *The Impact of Remittances on Economic Growth and Development in Africa*. *The American Economist*, 92-103.

Ghosh, Bimal (2006). *Migrants' Remittances and Development*: *Myths, Rhetoric and realities*. International organization for migration.

Goschin, zizi (2014). *Remittances as an Economic Development Factor: Empirical Evidence from CEE countries.* 7th International Conference of Applied Statistics.

Gujarati, Damodar N. and Dawn C. Porter. (2009). *Basic Econometrics (5thed)*. The McGraw-Hill companies

Hagen-Zanker, J. S. (2010). *Modest expectations: Causes and effects of migration on migrant households in source countries*. Boekenplan.

Heijdra, Ben J. (2009). *Foundations of Modern Macroeconomics* (2nded.). Oxford University Press, Oxford, New York.

Hill, R. Carter, William E. Griffiths and Guays C. Lim (2011). *Principles of Econometrics (4thed).* John Wiley & Sons Inc. USA

Kapur, Devesh (2003) Remittances: the new development mantra. Harvard University and center for global development. Paper presented to the G-24 technical group meeting

Konte, Maty (2014). *Do Remittances not promote Growth? A Bias-Adjusted 3 step Mixture of Regression.*

Lubambu, Karine Manyonga Kamuleta (2014). *The Impact of Remittances on Developing Countries.* European Parliament.

Naudé, Wimand Henri Bezuidenhout (2012). *Remittances provide resilience against disasters in Africa.* Maastricht Economic and social Research institute on Innovation and Technology (UNU-MERIT). http://www.merit.unu.edu

Opong ,Kwaku K (2012). *Prospect Theory and Migrant Remittance Decision Making*. Adam Smith Business School, University of Glasgow http://ssrn.com/abstract=2127615

Paderanga, Jr. Ayetano W. (2010). *The Macroeconomic Impact of Remittances in the Phillipines.*

Pradhan A.H., Afrin S. and Islam R. (2012) contribution of remittances on current account of balance of payments in Bangladesh: VECM estimation. International journal of applied research in business administration and economics. Vol.1 issue 1. p70-77

Ratha, Dilip., and Mohapatra, S. (2007). Increasing the Macroeconomic Impact of Remittances On Development. *World Bank*.

Ratha, Dilip, et al. (2011). Leveraging Migration for Africa: Remittances, Skills and Investments. The World Bank.

Ratha, Dilip (2013). The *impact of remittances on economic growth and poverty reduction.* Migration policy institute : policy brief No. 8

Simplicio, Do ango (2015). *The Effects of Remittances on Economic Growth in Cameroon: An ARDL-Bounds Testing Approach*. African integration and development Review Vol.8

Singh, Raju Jan Markus Haacker, and Kyung-woo Lee (2009*).Determinants and Macroeconomic Impact of Remittances in Sub-Saharan Africa*. IMF

Spatafora N. (2005). "*Two Current Issues Facing Developing Countries":* in World Economic Outlook: a Survey by the Staff of the IMF chapter two.

Todaro, Michael P. and Stephen C. Smith (2012). *Economic development (11thed.)* Pearson education, Inc. USA

Wooldridge, Jeffrey M. (2013*). Introductory Econometrics: A Modern Approach (5th ed. Cengage Learnings, USA*

Wooldridge, Jeffrey M. (2002*). Econometric Analysis Cross-section and Panel Data* p264

World Bank (2016). *Migration and Remittances Fact Book2016* (3rd ed.), World Bank Group

World Bank (2016). *Migration and Remittances*: *Recent Developments and Outlook*. Migration and development brief 26. World Bank Group

Yaseen, Hadeel S. (2012).*The Positive and Negative Impact of Remittances on Economic Growth in MENA Countries*. The Journal of International Management Studies, Volume 7 Number 1

Ziesemer, Thomas H.W. (2012). Worker Remittances and Government behavior in Receiving Countries. UNU-Merit Working paper series #2012-065

Appendix: Various Model Specification Tests for Various Estimations

Table A1: Regression Results of 5 comparative Models for Remittance Effect on GDP Growth

Variable	pooled	PA	BETWEEN	FIXED	RANDOM
lnrem	0.147**	0.146***	0.307*	0.143***	0.147***
lnoda	0.161**	0.165***	0.067	0.182***	0.161***
lnfdi	0.134***	0.133***	0.166**	0.130***	0.134***
termsoftrade	0.051***	0.051**	-0.030	0.052**	0.051**
_cons	14.130***	14.080***	12.493***	13.853***	14.130***
N	314	314	314	314	314
chi2	167.164	473.974			367.586
r2			0.520	0.552	
r2_o	0.446		0.510	0.428	0.446
r2_b	0.439		0.520	0.420	0.439
r2_w	0.552		0.497	0.552	0.552
sigma_u	1.064			1.085	1.064
sigma_e	0.250			0.250	0.250
rho	0.948			0.950	0.948

legend: * p<0.05; ** p<0.01; *** p<0.001

Table A2: Comparison of 5 Model Results regarding the Effect of Remittance on Poverty Reduction

Variable	pooled	PA	BETWEEN	FIXED	RANDOM
lnrem	-2.546*	-2.545**	-2.689	-3.145*	-2.546**
lngdpperca~a	-6.066**	-6.087**	-7.064*	-2.906	-6.066**
ginicoeffi~t	0.417	0.414*	-0.310	0.572*	0.417*
_cons	117.963***	118.187***	157.029***	102.137***	117.963***
N	87	87	87	87	87
ll			-115.870	-302.018	
aic	.	.	239.741	612.037	.
bic	.	.	249.604	621.900	.
chi2	20.834	28.012			26.780
r2			0.259	0.287	
r2_o	0.206		0.210	0.126	0.206
r2_b	0.183		0.259	0.072	0.183
r2_w	0.271		0.106	0.287	0.271
sigma_u	12.988			15.065	12.988
sigma_e	9.795			9.795	9.795
rho	0.637			0.703	0.637

legend: * p<0.05; ** p<0.01; *** p<0.001

Source: own computation using STATA13, May 2017.

Model Specification Tests:

1. Hausman test

It has asymptotic x^2 distribution

H_0: The difference between the coefficients of random effects and fixed effects is not systematic, i.e. random effects model is appropriate.

H_a: The coefficients of the two models differ significantly.

Criterion of the test:

If the probability of $x^2 < 0.05$ or the x^2 value is very large (say greater than 31.41) reject the null hypothesis and accept the alternative one, i.e. random effects model is not appropriate and thus fixed effect model will be chosen for estimation.

Based on this criterion since the probability of x^2 is 0.0957 which is greater than 0.05, we have no enough statistical evidence to reject the null hypothesis (i.e. we fail to rejectH_0). So the appropriate model is random effects. This tells us that the individual differences are random rather than fixed and hence the results of the estimation can be generalized to other countries.

2. Bruesch-Pagan Lagrange multiplier (LM) Test:-It helps to decide between random effects and simple OLS (pooled) regression.

H_0: There is no panel effect (variances across entities is zero), i.e. simple OLS regression is appropriate.

H_a: There is significant difference across units, i.e. random effects model is appropriate.

Criterion for the test is that if $x^2 < 0.05$ reject the null hypothesis implying that the random effect model is appropriate model. Otherwise retain the null and simple OLS estimation will be acceptable.

Table A3: Hausman model specification test for Growth effect of remittance in East Africa

```
. hausman FIXED RANDOM

                 ---- Coefficients ----
                 (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
                FIXED       RANDOM       Difference          S.E.
-------------------------------------------------------------------------
       lnrem     .1214067    .1300289      -.0086222              .
       lnoda      .443294    .2903962       .1528978        .0321711
       lnfdi     .1295899     .154637      -.0250471              .
termsoftrade     .4865557     .521309      -.0347532              .
-------------------------------------------------------------------------
                    b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =          22.33
                Prob>chi2 =         0.0002
                (V_b-V_B is not positive definite)
```

Table A4: Hausman test for growth effect of remittance in West Africa

```
. hausman FIXED RANDOM

                 ---- Coefficients ----
                 (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
                FIXED       RANDOM       Difference          S.E.
-------------------------------------------------------------------------
       lnrem     .2519482    .2698621      -.0179139        .0061756
       lnoda     .1285972    .1408367      -.0122395              .
       lnfdi      .12476     .1198505       .0049095        .0105156
termsoftrade     .0347709    .0302937       .0044772              .
-------------------------------------------------------------------------
                    b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =         67.59
                Prob>chi2 =        0.0000
                (V_b-V_B is not positive definite)
```