# UNIVERSITY OF GHANA

## DO REMITTANCES PROMOTE FINANCIAL DEVELOPMENT IN AFRICA?

**BY**

**NANA KWASI KARIKARI**


**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MPHIL FINANCE DEGREE**

**JULY, 2014**

## DECLARATION

I, Nana Kwasi Karikari, an M-Phil (Finance) student of the University of Ghana Business School do hereby declare that this thesis is the product of my own original research. I further declare that this piece of research or a part thereof has not been presented by anyone in this or any other University.

…….....….....… …….....

**NANA KWASI KARIKARI** Date

10395017

## CERTIFICATION

I hereby certify that this thesis was supervised in accordance with the procedures laid down by the University of Ghana.

.....…….....  .....

**SAM MENSAH,** PhD  **Date**

Supervisor

.....…….....  .....

**SIMON K. HARVEY,** PhD  **Date**

Supervisor

## DEDICATION

I dedicate this work to my father, Nana Kofi Karikari, who gave me immense support in all forms in my bid to attain this academic height.

My beloved mother, Mrs. Ivy Nana Karikari and my siblings Dr. Nana Kofi Karikari, Evelyn Nana Karikari and Eva Nana Karikari demonstrated their love and concern and offered their constant prayers and assistance towards this my noble course. In this context they deserve special mention.

## ACKNOWLEDGEMENTS

Mine is the firm conviction that the quantum of all the day long sweat and toil as well as the sleepless nights to see to the realization of this piece of research work are a manifestation of the abundant grace the Almighty God bestowed on me throughout my study. To Him therefore be the glory.

My immense gratitude goes to Dr. Sam Mensah and Dr. Simon K. Harvey, my lecturers and supervisors for their guidance and support that helped me realize the completion of this study. Indeed, the useful suggestions and maximum patience they had for me in the course of this study is, simply put, incomparable. To them therefore, I say: "Infinite Thanks".

My sincere and heart-felt thanks also go to Mr. Theophilus Tabi and Dr. Elikplim Agbloyor. I thank them for the inspiration and encouragement they gave me during my studies at the University.

Parents, siblings, and study mates, Joel Abakah, Safo Kantanka, Flora Opoku Asantewaa, Kwabena Asare, Frank Adusah-Poku and all my other benefactors did a yeoman's job by contributing in no small measure and in various and diverse forms to help me realize my dream . To them all, I say: "God Bless".

Finally, I do take cognizance of the fact that in the course of the study I was to some extent informed and influenced in one way or the other by other sources, all of which I am very grateful.

The above notwithstanding, I hasten to emphasize that any flaws or shortcomings that may be found in this research work are entirely mine.

## ABSTRACT

Remittances to developing countries have become not only the second largest type of flows after foreign direct investments but have also become more than official aids received. This paper uses data on remittance flows to 50 developing countries in Africa from the period 1990 to 2011 in studying the link between remittances and financial sector developments, the extent to which remittances may promote financial developments and the causality traceable between remittances and financial developments in Africa.

The study in particular examines the association between remittances and the aggregate level of credit to private sector, bank deposits intermediated by financial institutions and money supply in the developing countries, in this case, countries in Africa. This is an important gap considering the growth-enhancing and poverty-reducing effects of financial sector developments and immense growth of remittances received in the region over the years under study.

The study uses the fixed effects, random effect estimations and Vector Error Correction Model method on the panel data in examining the link between remittances and financial development proxied separately by credit to private sector, bank deposits and money supply, all as a percentage of GDP. The study provides evidence of a positive significant link between remittances and financial developments in developing countries in Africa in the short run but tends to be negative in the long run. However, it is evidenced that financial development had a positive effect on the amount of remittances received in the long-run. Again, remittances caused financial development and so did the development of financial sector cause higher remittances in the short run.

That is to say, remittances promote financial development to an extent as well as better financial system fostered the receipts of larger remittances, basically via formal channels. The effect of causality is well seen in both the long-run and the short run. The study then alludes to literature that remittances promote financial development and the development of the financial sector can help increase the propensity to remit.

# TABLE OF CONTENTS

**Content** **Page**

## LIST OF TABLES

# LIST OF FIGURES

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the Study

The impact of remittances on the financial sector of the recipient countries has been rarely explored in research. Funds received from migrants abroad are perceived to be used for survival purposes such as consumption, shelter, building human capital etc. The effect of these remittances on the development of the financial sector in the recipient countries is the purpose for this study.

Financial development, according to previous literature, has been very crucial to economic growth. Most researches undertaken in the area of financial development and economic growth come to a consensus and support the immense role financial development plays in the growth of many developing or emerging economies (Beck et al., 2004; Levine, 1997, 2004; Rajan & Zingales, 1998; Giulano & Ruiz-Arranz, 2005). Policymakers and economists generally agree that financial development, that is, well-functioning financial institutions and financial markets, such as commercial and investment banks, and bond and stock exchanges, contribute to economic growth. In recent years, there has been a burgeoning research into the potential determinants of financial development. Policies, effectiveness of institutions, financial liberation and many macroeconomic factors have been seen to promote financial development which in turn promotes economic growth (La Porta et al., 1997, 1998; Huybeus & Smith, 1999; Mayer & Sussman, 2001; Hermes et al., 2003).

Recent studies show it is now widely accepted that the private sector must be the engine of growth, and that governments must work to create the enabling environment for private

sector development. By facilitating transactions and making credit and other financial products available, the financial sector is a crucial building block for private sector development. Most of the macroeconomic factors that promote financial development have been considered in much research but how financial development is influenced and could be affected to an extent by funds received from migrants in foreign countries- remittances- is sought. Very little research has sought to find out how financial development is keenly promoted by remittances amidst other major promoters of financial development, since financial development is deemed very instrumental to economic growth.

Remittances for the past years have received a lot of attention due to their increasing nature to developing countries and the varied effects on recipient economies. Assistance by relatives to help other relatives overcome certain economic hardships have been long observed and appreciated by many who benefit from these assistances as well as economies. The World Bank in 2013 postulated that migrants working outside their countries of birth returned more than US$414 billion to family members in their countries of origin in 2012.

In recent times, monies remitted to most developing countries worldwide can be seen to have grown dramatically, from U.S. $68.5 billion in 1990 to U.S. $440.0 billion in 2010 (World Bank, 2011). A substantial amount of research undertaken has indicated that remittances have become the second largest source of external finance for developing countries after foreign direct investment (FDI)and represent about twice the amount of official aid received, both in absolute terms and as a proportion of GDP (Aggarwal et al, 2010). “Further evidence shows that in 2010, worldwide remittance flows are estimated to

have exceeded US $440 billion of which US $325 billion were transmitted to developing countries, an amount that far exceeded the volume of official aid flows and constituted more than 10 percent of gross domestic product (GDP) in many developing countries". Nyamongo et al. (2012).

Most researchers and policymakers have come to notice the rising amount and consistent nature of remittances to developing countries as put forward by Adenutsi in 2009. A growing number of studies have analyzed the developmental impact of remittances along various dimensions. The extent of the impact of remittances include poverty reduction, narrowing of the inequality gap, education, infant mortality, entrepreneurship and finally growth (Giuliano & Ruiz-Arranz, 2005). According to Gupta et al. (2009), one reason why remittances have attracted attention is that they are seen as more stable than other foreign currency flows to developing countries. "Remittances to sub-Saharan Africa are not only consistently less volatile than official aid; they are also less volatile than FDI, which is usually seen as the most stable private flow" (Gupta et al. 2009). Karapetyan and Harutyunyan, (2013) suggested that the Dutch disease is also likely to be an effect of the receipt of remittances despite any positive effect it might have on recipients.

Remittances also defined as the portions of cross-border earnings that migrants send home can be grouped broadly as official and unofficial. Official transfers use banks, money-transfer organizations and sometimes the Internet which are most often recorded. Unofficial remittances are sent through friends or migrants themselves or through traditional networks. A lot of research has indicated that recorded remittances are only a small fraction of total remittances to most recipient countries, especially countries in the sub-Saharan Africa. Freund and Spatafora (2005) argued that informal remittances to sub-

Saharan Africa were relatively high which could range from 45% to 65% of formal flows, compared to only about 5% to 20% in Latin America.

Remittances to African countries, according to Nuade, (2010) are unevenly distributed. There are indications of regional differences within Africa with respect to the amounts received but are however deemed to have very significant effects on the economy. The strong remittance flow to Northern Africa has been quite consistent and reflects patterns of international migration to Europe and the Middle East. Of the total remittances to Africa over the past decade, close to three quarters were received in Northern Africa (72%), about one fifth in East Africa (13%), and less than one tenth each in Southern and West Africa (7 and 5%, respectively). Central Africa recorded less than one percentage point in remittances.

In 2012, northern and western Africa, according to the World Bank, received more than 70% of total remittances. Nigeria, Senegal and Lesotho are among the highest remittance recipient countries in Africa. The importance of remittances expressed as a share of GDP has been seen to be very heterogeneous across the African continent. The World Bank in 2012 reported that the average share of remittances to GDP in Africa equaled 3.0%. Research indicates that this has been stable over time. Below is a table of some top recipient African countries in terms of share of remittances to GDP averaged for the 2005-2011 period.

**Table 1.1 Average shares of remittances to GDP (Top 15 African countries)**

| Countries | Average (2005-2011) |
|---|---|
| Lesotho | 35.4% |
| Nigeria | 10.4% |
| Senegal | 10.4% |
| Cape Verde | 10.4% |
| Togo | 10.3% |
| The Gambia | 9.0% |
| Liberia | 7.9% |
| Morocco | 7.7% |
| Egypt | 5.3% |
| Guinea Bissau | 5.1% |
| Tunisia | 4.4% |
| Mali | 4.4% |
| Uganda | 4.3% |
| Benin | 3.6% |
| Sudan | 3.6% |

For purposes of this research, countries that have their share of remittances to GDP to be equal to 1.0% or higher will be considered for inclusion despite the earlier indication that the recent average of share of remittances to GDP was 3.0%. Research indicates that countries with their share of remittances above this threshold are well positioned to have a significant effect from remittances received. However, the flow of remittances as earlier indicated is less accounted for due to the informal ways of transmission and thus this study concentrates on the remittances that are transferred via formal channels since it is nearly impossible to estimate informally transferred remittances.

According to Bayangos and Jansen, (2011), much of research have focused on households: how receipt of remittances affects poverty and household decisions, for example, with

respect to education and health care. But there was also attention for the macro economic impact of migration and remittances. Remittances offer an opportunity for developing countries to look at ways of benefiting from their citizens who have chosen to live and work abroad, rather than focusing on the negative consequences such as the Dutch disease and the much talked about brain drain of skilled individuals who migrate in search of greener pastures though these issues are not to be neglected. (Cox-Edwards et al, 2003; Faini, 2007; Giuliano et al, 2009; Adenutsi, 2011).

These studies have primarily concentrated on the impact of remittances on development and economic growth on recipient countries. Nyamongo (2010) postulated that during the 1990s remittances appeared to have stabilized at a level slightly above US $ 10 billion, with an average annual growth rate of 5.1 percent in Africa. Again, during the 2000s the remittances appeared to have gained prominence. They stood at US $ 11.2 billion in 2000 rising rapidly at an average rate of 13.4 percent during this period to stand at US $ 40.9 billion in 2008 before declining slightly by US $ 3.1 billion to stand at US $ 37.8 billion in 2009.The increasing levels of remittances according to Anyanu, (2008), Gupta et al., (2009) and Nyamongo, (2010) during these periods brought about poverty reducing effects in countries as Lesotho, Gambia, Nigeria, Cape Verde and all other high recipients of remittances in Africa. This also led to an average increase in economic growth to over 2.6% (World Bank, 2011).

An economy's financial markets are critical to its overall development. Banking systems and stock markets enhance growth, a major factor perceived in poverty reduction. “Strong financial systems provide reliable and accessible information that lowers transaction costs, which in turn bolsters resource allocation and economic growth.”(World Bank, 2012).

Financial development can be described as the growth and robustness of financial sector and intermediary services in any given economy. The development of the financial sector is said to be when financial instruments, markets and intermediaries work together to reduce cost of information, facilitate trading, diversification and management of risk. It also comprises the activities that seek to defer consumption, mobilize and pool savings and promote the exchange of goods and services to create greater wealth. This in total leads to economic growth as posited by many researchers. According to Department for International Development (DFID) it can also play an important role in reducing risk and vulnerability, and increase the ability of individuals and households to access basic services like health and education, thus having a more direct impact on poverty reduction.

Despite these concerns of financial development, little research has unearthed the major contributions that remittances from migrants do make in promoting financial development which convertibly leads to massive economic growth in the short and long terms. There is therefore the need to take a closer look at how much remittances may promote financial development amidst other financial development promoters.

Looking at how remittances may promote financial development, some researchers have had diverse and opposing views as to the impact of these remittances on financial sector development and economic growth in emerging economies. According to Caceres and Saca (2006), "remittances would mostly be used for consumption, sometimes even conspicuous consumption, and that the same community characteristics that led to migration also dampen the productive use of incoming remittances." Fiani (2007) supported the argument that remittances that were received were insignificant to financial

development and economic growth and again the result of migration was the disadvantageous brain drain.

However, Woodruff and Zenteno (2001) estimated that remittances accounted for about 20% of the capital invested in microenterprises in urban Mexico. Again, studies that link remittances to investment, where remittances either substitute for, or improve financial access, conclude that remittances stimulate growth (Giuliano& Ruiz-Arranz, 2006; Calderon et al., 2007; Gupta et al., 2007). Again, remittances according to Orozco and Fedewa, (2005) can lead to financial development in developing countries based on the concept that money transferred through financial institutions paves the way for recipients to demand and gain access to other financial products and services. A study conducted by Karapetyan and Harutyunyan, (2013), indicated that remittances could make a positive contribution to the growth of the capital stock either through their impact on widening the deposit base of the banking system or directly through financing business investments.

These seemingly contrasting views of the impact of remittances on financial sector development and economic growth in general has propelled this study, looking at how and whether or not remittances promote financial development in emerging economies, specifically in Africa. This is so since financial development undoubtedly is a major key to economic growth which is accepted by all emerging economies and also when we consider the growing rate of the adoption of money transfer operators by various financial institutions. This draws attention to the transmission mechanisms of remittances to the financial sector. These monies received by the locals may be used to purchase financial securities and products.

Much concentration is being placed on African countries since extensive research has been carried out in countries in Latin America and other developing countries which focused on economic growth specifically (Levine, 1997; Beck al., 2004; Giuliano& Ruiz-Arranz, 2005; Sangjoon, 2012). This study will concentrate on the geographical regional sectors in the whole of Africa considering the legal systems, natural disasters and political stability.

### 1.2 Statement of the Problem

Quite a lot of researchers draw qualitative presumptions or conclusions about remittances. For instance, using nationally representative household data from Ghana, Adams (2006) concluded that remittances reduce poverty in recipient households, especially when transfers are from abroad. Again, "there are marked regional differences in remittance flows. Since the 1980s, remittances to countries in Latin America, the Caribbean, and the East Asia, and Pacific regions have grown more rapidly than the average for developing countries generally", (Gupta et al. 2009). On a macro level, using a panel data of 71 countries, Adams and Page (2005) conclude strongly that remittances reduce poverty in developing countries. Giuliano et al., (2009), studying the Latin America and Caribbean countries opined that remittances significantly promoted economic growth.

Research has indicated various views about the impact of remittances on economic growth directly or indirectly through financial development in many emerging economies or developing countries. According to Aggarwal et al. (2010), remittances are usually lumpy and that recipients might have a need for financial products that allow for the safe storage of these funds as well gain some amount of interest earnings from the savings and boosting the financial sector. This is normally done through bank deposits of excess of

funds from remittances. De Marulanda et al., (2006) also posited that with this, banks will be able to extend banking services or products and other investment opportunities to 'unbanked' recipients and create adequate financial intermediation which is of great value to the recipients of the remitted funds which could have been merely consumed and not creating any further wealth. Gupta et al., (2009) also alluded to these findings.

From a contrasting perspective, remittances, according to Calderon et al. (2007), can "lower credit demands and have dampening effect on the credit markets." Again, "a rise in remittances might not translate itself into an increase in credit to the private sector if the flows from the remittances are channeled to finance the government or if the banks are reluctant to lend and prefer to hold liquid assets."Chami et al., (2005), also postulates that remittances make recipients who receive remittances through informal channels, sidestep the many financial requirements in acquiring capital, which are seen as constraints. This makes less use of the financial sector services and products which in turn does not promote the financial sector. Most researches and studies relying on household data in sub-Saharan Africa have yielded insights into how remittances impact at the micro level, as put forward by Gupta et al, (2009).

From all indications, very little research has been conducted on whether remittances promote financial development despite the linkage to economic growth in emerging economies, and also considering the mode of remitting these funds which may be official or non-official. This research seeks to look at the aggregate impact of remittances on the financial development of selected emerging and developing economies in Africa. Similar research carried out in Asian, Latin American and the Caribbean countries concentrated on the impact of remittances on economic growth as a whole and quite a few on a specific

issue such as poverty (Levine, 2004;Spatafora, 2005; Adams & Page, 2006; Mundaca, 2009; Yaseen, 2012). This research considers the whole of the African continent unlike those that have concentrated on some Sub Saharan African countries only (Gupta et al., 2009).

How and whether or not remittances might affect financial development, particularly in the promotion of financial development is very unclear in past literatures, though financial development is primary in the growth of the economy. This research seeks to take a closer look into the ways that remittances promote financial development in the African continent comparing previous research in literature conducted in other developing economies.

A strand of argument holds that countries with well deepened financial development do not have much impact from remittances compared to countries with shallow financial sectors where potential investors encounter credit constraints fall on remittances for support. However, Aggarwal et al., (2010) argue that the distrust of the financial systems and institutions may not boost deposits of remittances and thus well-developed financial sector will attract remittances which will boost the economy as a whole. One side of the arguments made in previous research, though little, concerning remittances and financial development posits that well developed financial systems effectively attract remittances whereas other sides share the conviction that remittances are a push to financial development (Gupta et al., 2009). This research also intends to find out if there are any lines of causality traceable among financial development and remittance inflows to Africa.

### 1.3 Research Purpose

The purpose of this study is to find out the impact of remittances on the financial development of African countries. This research seeks to find out how much remittances have promoted the financial sector development of the Africa continent amongst other factors that promote financial sector development. This research seeks to know whether the level of financial deepening affects the impact of remittances received, thus find out the direction of causality that exists between financial development and remittances in Africa. Remittances mostly accounted for and recorded for financial and accounting purposes are those that are received through formal banking processes. This research also seeks to find measures that could be adopted by financial institutions to attract most remittances to go through proper financial systems.

### 1.4 Objectives of the Study

1. To identify whether or not remittances promote financial development in the case of Africa.
2. To identify the extent to which remittances promote financial development in Africa.
3. To identify the causality traceable between remittances and financial development.

### 1.5 Research Questions

1. Are remittances a cause/ promoter of financial development?
2. To what extent do remittances promote/contribute to financial development?
3. Is there a causal relationship between remittances and financial development?

### 1.6 Significance of the Research

The study of the effect of remittances on financial development in emerging economies has much significance. This study is significant because as a whole it will contribute to the body of knowledge in this area of study. It is clearly noted, though arguable, that very little has been done in this research area. Most of the study or research on the impact of remittances is well concentrated on the macro economy level, specifically the aggregate economic growth. This study concentrates on whether remittances help promote financial development or dampen it. Further studies could be carried on for a closer analytical study of the research area.

The study will also serve as a guide for policy makers from government and especially financial institutions or agencies. This study clearly looks at what policy makers can do to improve on the existing policies in the contribution to economic development through remittances for financial development.

### 1.7 Chapter Outline

The research contains five (5) chapters. Chapter one introduces the subject matter in the background of the study. The purpose and then the objectives of the study follows, then the questions to be used in carrying out the research. This is followed by the significance and finally by the organization of the study.

Chapter two (2) deals with the literature. This concentrates on the research undertaken by other researchers concerning the promotion of financial development through remitted funds in developing countries.

The third chapter focuses on the approaches to be employed to complete the research. This looks at the area of the study, the population on which the research findings would be

generalized, the sample and sampling techniques and methods to be used in collecting data for the research.

Chapter four (4) presents the analysis of the data gathered, the presentation of data or results and discusses the findings. Chapter five (5) comprises the summary, conclusions and recommendations.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.0 Introduction

The literature overview seeks to survey scholarly articles and books published by accredited researchers and relevant to the study and also provides a description, summary and critical evaluation of each work with the aim of achieving the research objectives. Both theoretical and empirical reviews are considered.

While the development potential of remittance flows has increasingly been recognized, the effects of remittances on financial development have remained largely unexplored. Better understanding of the impact of remittances on financial development is important given the evidence on the growth-enhancing and poverty-reducing effects of financial development. This research therefore endeavours to explore the existence and the extent of impact of remittances on financial development in Africa and considers a reverse effect, if any, from financial development to remittances received.

## 2.1 Overview of Remittances

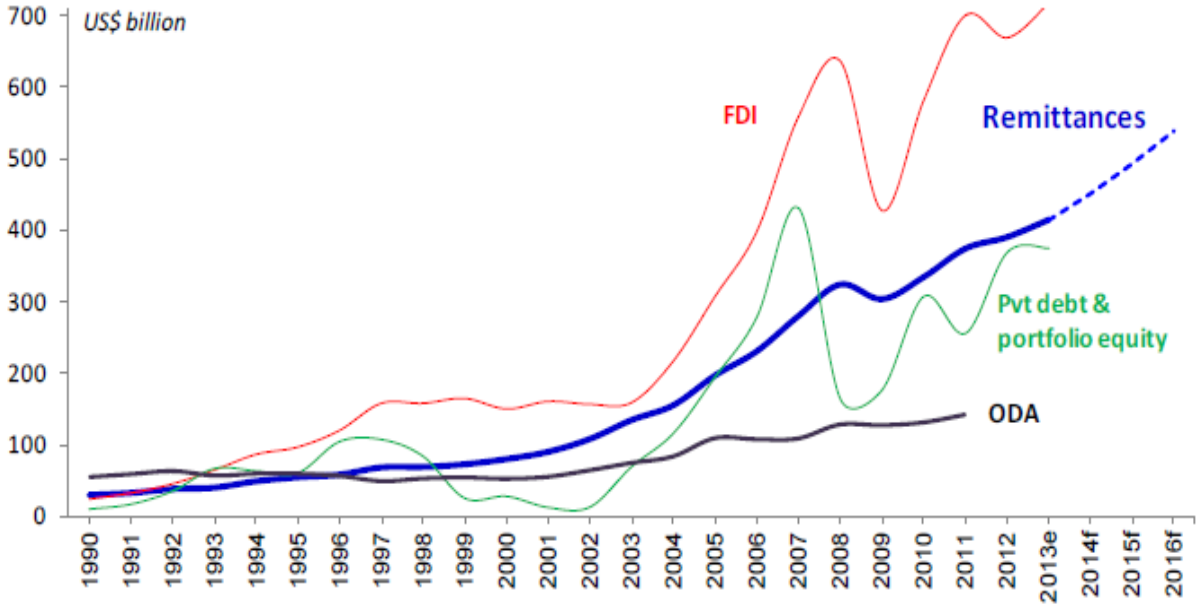
Remittances are defined as private income transfers from one or more family members living and working abroad to the remaining family in their home country (Chami et al. 2006). Much research has concluded that remittances reduce poverty by enabling the recipient families to increase consumption and escaping certain economic hardships (Buch & Kuckulenz 2004; Maclellan & Mares 2005; Ratha 2007). According to Guillano and Ruiz Arranz, (2008) remittances by international migrants to their countries of origin constitute the largest source of external finance for developing countries after foreign direct investment (FDI). Officially recorded remittance inflows amounted to $125 billion

in 2004, exceeding total development aid by 50%. The World Bank, (2009), broadly indicated that migrants' remittances or funds received from migrants living abroad to developing countries have grown dramatically in recent years from U.S. $3.3 billion in 1975 to U.S. $289.4 billion in 2007.

In 2009, approximately U.S.$414 billion in remittances were sent by migrants and of this amount, U.S. $307 billion were sent to developing countries (IMF, 2010). In 2010, U. S. $21.6 billion were sent to Sub-Saharan African countries, representing a 571% increase from U.S. $3.2 billion in 1995 (The World Bank, 2010). Remittances are the second largest source of external funding to developing countries and they are about twice as much as the official aid inflows to developing countries (Adams & Page, 2005).

Previous research indicates that in general, remittances are highly momentous to low-income economies and constitute about two (2) percent of their gross domestic product (GDP) and six (6) per cent of their imports (World Bank, 2003). Further research and various studies put forward that these remittances have, in recent years, outdone foreign direct investment (FDI) in certain developing economies, official development assistance (ODA), export revenues and certainly foreign aid in most remittance receiving countries (Giuliano and Ruiz-Arranz, 2005; World Bank, 2006). Aggarwal et al., (2010) posit that remittances have become the second largest source of external finance for developing countries after foreign direct investment (FDI) and represent about twice the amount of official development aids received, both in absolute terms and as a proportion of GDP.

**Figure 1: Remittances flows are large, and growing**




*Sources*: World Development Indicators and World Bank Development Prospects Group

From the above, remittances are seen to be increasing and are higher than funds received from Official Development Assistance (ODA) as well as private debt equity portfolio but second to Foreign Direct Investments (FDI). (World Bank, 2012).

Literature on remittances is mainly centered on the issues of economic growth and the poverty alleviation effects of remittances. Most of the existing studies illustrate the positive, direct and indirect, growth effect of remittances especially for the developing countries employing cross country data. However, some researchers have established linkages between remittances to emerging economies, financial development and economic growth with high concerns for the impact of financial development on economic growth. (Beck et al., 2004; Chami et al., 2003; Giuliano and Ruiz-Arranz, 2005; Rao and Hassan, 2010).

Other researches, though very few, have tried to answer the question of how and whether or not remittances may influence financial development in recipient developing countries.

This issue is important because financial systems perform a number of key economic functions and their development has been shown to foster growth and reduce poverty (King & Levine, 1993; Beck &Levine, 2000; Beck, Demirguc-Kunt, & Levine, 2004). This research intends to fill in the less explored lacuna that relates remittances to financial development in Africa.

Most studies on remittances have focused on the developmental impact on issues such as poverty, education, entrepreneurial activity, and health. Research on the impact of remittances on poverty and sustenance using domestic household data particularly in the Latin America and Caribbean regions have it that these transfers help reduce the level of poverty, but have an even greater influence on its severity, as measured by the poverty gap (Adams, 2004; Lopez-Córdova, 2005, Taylor et al., 2005). Quite a number of studies that have endeavoured to investigate the effect of remittances on a range of socio-economic outcomes on the receiving countries mostly draw to the conclusion that remittances are geared to supporting the welfare of those relatives left behind and therefore contribute to the poverty eradication in the recipient countries or economies which are very visible in the improvement of the standards of living of these recipients. (Adams & Page, 2003, Adams, 2004; 2005; Gupta, et al., 2007; Nyamongo, 2012). A substantial number of studies on poverty alleviation effects of remittances on developing countries suggest that remittances reduce both the level and severity of poverty in Guatemala and Mexico and other Latin American and Caribbean (LAC) countries as well as the Asia (Adams ,2005; Taylor et al. ,2005).

The immediate welfare-enhancing role of remittances is critical at both the micro economic and the macroeconomic levels. However, it does not fully explain the role of

remittances in promoting the development of the financial sector in recipient countries. To critically understand how remittances affect the long-term economic growth potentials, there is the need to also focus on the indirect consequence of cross-border money transfers that is the effect of remittances on financial development. Because migrant transfers entail cross-border flows of relatively modest sums of money, they present an opportunity for low-income households to access formal financial services and products. This most likely begins with savings products offered by various financial institutions. However empirical studies show that the macroeconomic effect of remittances depends on how recipients may choose to utilize the monies received. One side of literature indicates that remittances would mostly be used for consumption, unproductive consumption, and that the same community characteristics that led to migration also dampen the productive use of incoming remittances. Some literature concerning the effect of remittances the Latin Americas as conducted by Caceres and Saca (2006) found out that remittances were characterized by a decline in savings, so that economic activity actually contracted. However, Woodruff and Zenteno (2001) estimated that remittances accounted for about 20% of the capital invested in micro enterprises in urban Mexico. Using a panel data, this research seeks to find this situation in the context of the African continent.

The use of remittances is basically determined by the recipient. This makes it quite cumbersome to determine the aggregate effect of the remittances on the economy as a whole. The effect of remittances on growth in cross-country studies is inconclusive. Research that concentrates on the labour supply response of recipient households finds that remittances tend to lower growth through the unproductive use of remittances received (Chami et al.,2003; Azam & Gubert, 2006). However, other studies conducted in Latin America and Asia have tried to draw the nexus of remittances to investment, where

remittances either substitute for, or improve financial access, concluded that remittances stimulated growth through investment motive of recipients (Giuliano & Ruiz-Arranz, 2005; Toxopeus & Lensink, 2006). While the evidence on the contemporaneous effect of remittances on growth may be mixed, it is likely that remittances can affect long-term growth by encouraging financial deepening (Nyamongo, 2010). Remittance supporters posit that remittances help improve recipients' standard of living and encourage households' investment in education and health care and have a propensity to save to generate greater wealth. Remittances are also necessary for financing imports and investment. However, the negative view of remittances indicates that remittances can fuel inflation, detrimental to financial development and reduce recipients' incentive to work which are obviously harmful for growth.

For the thriving nature of every economy, all necessary factors should be considered. Economic growth is desired by many, both the developed and the developing or the emerging economies. Financial development according to previous literature is said to have a positive impact on economic growth. An extensive body of literature has emphasized the vital role of the financial sector in facilitating economic growth and development. According to the World Bank, (2011), a well-functioning financial sector is expected to attract idle funds for financing economic growth and development projects. King and Levine (1993) generally suggest that through a number of mechanisms, financial development impact positively on economic growth.

The positive effect of financial development on growth has been extensively documented (Rajan & Zingales, 1998; Levine, 1997, 2004; Beck et al., 2004). Research on the effect of remittances on economic growth is quite much but has so far not yielded quite clear

results. Using a panel of 113 countries over almost three decades, Chami et al. (2003) state clearly that remittances are negatively associated with economic growth. This result is consistent with their representation in which remittances weaken recipients' incentives to work and, therefore, lead to poor economic performance. However, Solimano, (2003), on the other hand, found a positive association between remittances and growth for a panel of Andean countries, while the IMF's 2005 World Economic Outlook highlights the lack of correlation between these variables, at least at the country level. Nevertheless, two separate studies by Giuliano and Ruiz-Arranz (2005) and Mundaca (2005) showed that the impact of remittances on growth could depend on the level of financial development in a country.

**2.2 Recent Trends of Remittances.**

The growth of migrants' remittances to their home of origin and neighbouring countries has been robust in all regions of the world in recent times, except for Latin America and the Caribbean, where growth slowed down due to a sharp decline in remittances to Mexico (World Bank, 2013).

Remittances to various countries in the underdeveloped zone have been recognized as significant in becoming a substitute for inefficient or inexistent credit markets, remittances help alleviate credit constraints contributing to improve the allocation of capital and to boost economic growth.

Remittances by international migrants to their countries of origin constitute the largest source of external finance for developing countries after foreign direct investment (FDI).

There are marked regional differences in remittance flows pertaining to the developing countries despite the increasing characteristic of remittances to the developing countries. Since the 1980s, remittances to countries in Latin America, the Caribbean, and the East Asia, and Pacific regions have grown constantly and more rapidly than the average for developing countries generally. In 2006, the top three recipients which were China, India, and Mexico accounted for more than one-third of the remittances to developing countries. Among the top 25 recipients of remittances, only one (Nigeria) is in sub-Saharan Africa, but three of the eight countries in South Asia (Bangladesh, India, and Pakistan) appear on the list. This proves the relative differences in remittances when we take into consideration a regional perspective considering the African continent as a whole`.

In South Asia, remittances are substantially increasing annually and are noticeably supporting the balance of payments of the economy for a substantial number of fiscal years now. In Bangladesh, Nepal, Pakistan and Sri Lanka, remittances are reported to be larger than the national foreign exchange reserves, not neglecting the increasing nature of migrants' remittances within the North African region (World Bank, 2012). According to Freund and Spatafora, (2005), "workers' remittances to developing countries have grown rapidly, to more than $100 billion in 2004, bringing increasing attention to these flows as a potential tool for development."

Again, empirical evidence of research conducted by Lucas (2005) suggest that international migrant remittance inflows which are at a growing rate, promote economic growth through positive impact on consumption, savings and investment in India, Morocco and Pakistan.

The main sources of global remittance flows are the United States, which were estimated to be U.S. $53 billion in outward remittances in 2011, and then followed by Saudi Arabia

with U.S. $28 billion. Switzerland, Germany, and Russian Federation are all deemed as important sources of remittances to most developing countries. Officially recorded remittance flows to Sub Saharan Africa were expected to increase by 6.2 percent in 2013 to reach $32 billion.

Remittances from other developing countries according to Adams (2008) make up for approximately forty (40) per cent of remittances received by developing countries, which means that about half of migrants from developing countries migrate to other developing countries or neighboring developing countries. Arguably, remittances to low-income countries may originate from middle-income countries. In the same sense, remittances that flow to Africa may originate elsewhere in Africa rather than in other continents as put forward by literature. Remittances from Europe and Asia are mainly sent to the Latin America and Caribbeans, and North Africa (Agunias 2006).

In Africa, the flow of remittances is gaining much recognition despite the fact that the African continent receives relatively a lower amount of the world's remittances when compared to the other developing continents. This shift in attention may be due to the fact that remittances are an important source of foreign exchange and are helping to cover current account deficits in the region. Therefore, considering the aggregate financial sector impact of remittances giving cognizance to 'sectored Africa' in terms of regions is deemed appropriate and an important lacuna to fill.

According to past literature, despite the low amount of remittances to the African continent compared to other developing regions, Nigeria accounts for more than half of total remittances in the Sub Saharan region. However, as a share of GDP, the largest recipients are Lesotho, Togo, Cape Verde, Senegal and The Gambia. According to Ghosh

(2006), Lesotho is the highest recipient on a list of twenty (20) remittance recipient countries with close to a 40 percent share of GDP which he computes as an average for the period 1990-2003. Among the Sub-Saharan African countries Nigeria was the leading recipient with US $9.6 billion in 2009. Other leading destinations in the region were Sudan (US dollars 3.0 billion) and Kenya (US dollars 1.7 billion). On average, Nigeria received US$3.23 billion annually. This trend is a reflection of high levels of emigration in Nigeria. Nigeria has, over the years, experienced considerable emigration mainly due to the large size of its population and also due to political upheavals experienced in the country. Between 1967 and 1970, the Biafra war forced more Nigerians to emigrate, thereby causing even more people to seek refuge outside Nigeria. Such an enormous number of migrants, accounted for large amounts of remittances to Nigeria (Montclos 2005), which brings us to the thought that, countries that have suffered a considerable high incidents of natural disasters, political upheavals and even conflicts, are prone to receive much remittances from natives who have migrated to other countries.

The impact of remittances have been long argued amongst many economists and researchers. The benefits and detrimental effects of remittances can be seen in quite a lot of literature. One school of thought which was propelled by Stahl and Arnold (1986) and subsequent thoughts by Massey et al. (1998), Schumpeter (1911) and de Haas (2003) believes that migrant remittances that were received by the recipient countries or developing countries often contribute positively to the mitigating if not the total removal of production and investment constraints, raising real income levels and minimizing balance of payments problems of these developing countries.

According to literature, "remittance inflows help to narrow the trade gap, control external debt, facilitate debt servicing and supply foreign exchange with migrants sometimes using their earnings as a source of financing to development projects in their native countries. However, another school of thought postulates that international migration drains developing countries of highly trained and skilled labour and capital by crowding-out domestic production of tradable goods in the brain-drained underdeveloped economy (Stark and Levhari, 1982; Taylor (1984) Ahlburg, 1991; Rubenstein, 1992; Chami et al., 2005). They further argue that, migrants' remittances increased and deepened the 'foreign-dependency' mentality of developing countries and thus the remittances can cause higher inequality among households and macro-economic instability in the form of inflation through excess demand for consumables relatively causing deficit in domestic production capacity of developing countries. These studies however fail to assess the possibility of remittances impacting on the financial sector development of the countries studied which has earlier been seen to foster economic growth in most developing countries.

## 2.3 Channels of Inflows and Costs of Transfers.

### 2.3.1 Channels of Remittances.

Remittances that have received a lot of attention lately are deemed to be severely understated since most of the migrants' funds sent home are done mainly through informal channels.. Literature postulates that the official channels involve transfers using the banking system and money-transfer organizations whereas unofficial channels involve sending remittances mainly through cash or in-kind transfers through carriers, such as family members, friends or other carriers that do not require any formal documentation and sometimes void of transaction costs (Gibson, 2005). The literature may define

informal remittances as all types of money transfer services that do not involve formal contracts, and hence are unlikely to be recorded in national accounts.

According to Freund & Spatafora (2005), formal channels include money transfer services offered by banks, post office banks, non-bank financial institutions, and foreign exchange 'forex' bureaus and money transfer operators like Western Union and 'MoneyGram'. In addition, more advanced Hawala and Hundi systems allow faster transfers, relying on a network of agents that transfer money quickly. Monies or goods taken by the migrant on his/her seasonal visits to his/her homeland and funds remitted through unlicensed money transfer operators using traditional networks such as Hawala constitute informal channels of migrants' money transfer as put forward by Nyamongo, (2012).

At the global level, Freund and Spatafora (2005) estimated that informal remittances accounted for about 35% to 75% of official remittances to developing countries. The study indicated that informal remittances to Eastern Europe were relatively higher compared to other regions such as the Eastern Asia and the Pacific. Jiménez-Martín et al. (2007) in a study commissioned by the European Commission, accounting for remittances, estimated that a larger percentage of bilateral workers' remittance flows from the EU, were through informal channels.

As postulated by Nyamongo and Misati,(2011) as well as Aggarwal et al. (2010), remittances that are channelled via the formal sector, avenues or procedures greatly impact growth of financial sector and the economy immensely. According to reviewed literature, this occurs especially when the recipients of such funds open accounts with financial institutions, specifically banks. Again, these financial institutions are able to advance

information when the recipients visit the banks regarding existing bank loan products which they are likely to take advantage of. If this effect on financial sector is substantial then we expect higher financial development. But as shown in the literature, financial development is also linked to private investment and economic growth as put forward by various researchers in the area of remittances (Mundaca, 2009; Nyamongo, 2010, 2011; Adenutsi, 2011).

Records concerning remittances received by developing countries are deemed inaccurate. According to a recent survey conducted by the firm Bendixen & Associates (2004) among 38 entities in the United States, 87% of migrants from Latin America and Caribbeans (LAC) residing in the U.S. send back money through remittance companies, U.S. banks and credit unions, whereas the remaining 13% send their money through third persons, public or private mail, or by "pocket transfers" (money or goods brought personally by migrants on their visits, however a significant proportion of the remittances flows sent to African countries are not registered since they are transmitted mainly through informal channels. An example is *xawilaad*in Somalia and *hawala* formed by immigrants in foreign countries. Surveys on remittances sent through informal channels still remain scanty.

Cultural and cost factors are deemed to be some important factors that affect the use of informal channels. Sending remittances with co-ethnics helps to strengthen social relations with friends, family and local communities. Again, high costs of transfer, dual exchange rates for money transfers, lack of legal documentation for formal transactions by remittance-sender migrants, and inadequate money transfer infrastructure are additional reasons behind the use of informal channels (Grabel 2008; Irving et al.2010).

It is estimated that at least 80% of remittances to Uganda and Sudan are sent through informal channels, while for some African countries the value of remittances in kind might be equal to or higher than money remittances (Sander & Maimbo 2003).Freund and Spatafora (2005) in studying the cost and transmission channels of remittances indicated that there were a lot of variations in the channels of transmission. Other studies estimated that data from Uganda imply that a large share of remittances enter the country informally. This was consistent with the results from Freund and Spatafora (2005) on Sub-Saharan Africa from their aggregate estimation, which support high informal flows to the region. In addition, data from France show that 70percent of remittances to Mali and Senegal move in informal channels (ECFIN 2004).The choice of a channel for remitting money may also depend on a number of factors. The most prominent among these are: the cost of the transaction, speed, security of funds, geographic proximity/ accessibility, convenience in terms of familiarity and language. The attractiveness of formal and informal channels varies greatly across these factors.

According to recent research, it has been indicated that over time, the informal sector has been shrinking, especially in Latin America and Asia. To some extent, this development has generated misleading impressions about the true speed at which remittances are growing. Reductions in transaction costs according to the World Bank would encourage a further shift of remittances towards the formal sector. Such cost reduction could be usefully pursued through measures to enhance competition in the banking sector, promote financial development, and reduce exchange rate volatility (Freund & Spatafora, 2005).

### 2.3.2 The Cost of Transferring Remittances.

The cost of sending money to Africa, however, remains relatively high and subject to wide variations according to the World Bank report on remittances in 2011. Fund transfer costs from the United States are generally among the lowest, followed by transfer costs from Europe according to the World Bank (2012). The cost of sending remittances within the African continent is somehow far higher. Empirical research conducted by Sander et al., (2003) has it that the cost of sending remittances from South Africa to other African countries is generally higher than sending money to Africa from abroad. These costs range from 12 percent to as high as 25 per cent of the amount sent. Globally, studies indicate that informal channels are cheaper than formal ones. The pure monetary cost (transaction cost) of remitting money across borders using official channels is estimated at approximately 13 percent of the remittance value.

Remittances are particularly relevant and particularly expensive when being transferred to Africa's underserved rural areas, which receive an estimated 30-40 per cent of all flows. Often these remittances are picked up far from home, and families must add substantial travel costs and time to the already high transfer fees. Informal channels are typically deemed faster and more convenient as they are not constrained by banking and foreign exchange regulations and often work in close proximity to their clients and frequently provide door-to-door services. Unlike banks, informal channels do not require the customer to have a bank account or any knowledge about operating one.

The cost associated with remittance transfers are mainly charged with funds sent via the official means such as through financial institutions as well as certified Money Transfer Operators (MTO's).With official remittance flows to the continent growing to a record $60.4 billion in 2012 and in some cases overtaking foreign direct investment and official

development assistance as the largest external financial source for the first time, according to the African Development Bank (2012),it is likely to gain more urgency and an elaborated attention on issues concerning its sustenance and efficiencies to the recipient and thus the developing country as a whole.

The need to reduce the cost of remittances to Africa may be one of the few issues to have economists and policymakers nodding in agreement. Intra-African transfers are even more costly according to a recent study by the World Bank. In South Africa and Tanzania average remittance prices or charges are 20.7 percent and 19.7 percent respectively (World Bank, 2012). Certain African banks, such as Kenyan's KCB and Equity Bank and other financial institutions, are taking a greater interest in migrants and offer Diaspora accounts. Financial institutions as well as Money Transfer Operators are coming up with solutions to substantially reduce the cost of money transfer.

In 2009, the G8 and G20 endorsed the "5x5" objective to bring global remittance prices or charges down to 5 percent within five years, or by 2014. Lower prices would allow families in Africa that rely on remittances to save or invest in education or small businesses, according to World Bank remittance study.

Africa is the most expensive continent to send money to, with transfers costing an average of 11.67 percent of the amount being sent, compared to around 8.35 percent for Asia. The global average cost is just over 9 percent. An average transaction cost of 11.67 percent would have deprived some of the world's poorest people of more than $7 billion in 2012, the World Bank says. There are other expenses besides the transaction fees. Africa has the least payout locations in the world, which means recipients who live in rural areas face the prospect of traveling for a day or more to collect their money. The high costs force

migrants to send money through informal channels so the true size of remittance flows to Africa could be more than double the official figure, some experts believe.

However, according to the World Bank, the average cost of sending remittances to Latin America was 7.3% in late 2013, which had been seen as a decline in the cost of transfer from past years (World Bank, 2013). This decline according to some research was attributed to the growing role of technology, especially mobile banking and online money transfers, as well as increased competition, making it easier to send money home (Orozco, 2012). It has also made it easier, along with improved measurement methods by banks, for governments and central banks to track remittances. Lower costs, improved technology and better tracking methods are deemed, according to recent research by the World Bank and other institutions, to have played a role in increasing the sum of formal remittances, and some research suggest that these factors, not fundamental economic changes, likely account for most growth in formal remittances over the recent periods (Orrenius et al., 2012)

In 2012, the World Bank indicated that if transaction costs were lowered even by 5 per cent, remittances to developing countries would increase by U.S. $3.5 billion a year. The World Bank also indicated that in many countries formal money transfers are expensive and at times heavily taxed. US researchers who have examined ways to reduce transfer fees report that average costs amount to 12.5 per cent of the sums transferred, amounting to between U.S. $10 and U.S. $15 billion annually.

**2.4 Financial Development in Africa.**

Financial development can be defined as the policies, factors, and the institutions that lead to the efficient intermediation and effective financial markets. A strong financial system offers risk diversification and effective capital allocation. The greater the financial

development, the higher would be the mobilization of savings and its allocation to high return projects (Adnan, 2010).

Financial development can be described as the growth and robustness of financial sector and intermediary services in any given economy. Financial sector development thus involves the establishment and expansion of institutions, instruments and markets that support investment and growth processes in an economy. This in total leads to economic growth as posited by many researchers. According to Department for International Development (DFID) it can also play an important role in reducing risk and vulnerability, and increasing the ability of individuals and households to access basic services like health and education, thus having a more direct impact on poverty reduction.

Previous literature postulated that financial systems play a crucial role in alleviating market frictions and hence influencing savings rates, investment decisions, technological innovation and therefore long-run growth rates (Schumpeter, 1911; Gurley and Shaw, 1955; Goldsmith, 1969; McKinnon, 1973; Miller 1998). According to recent literature financial systems help mobilize and pool savings, provide payments services that facilitate the exchange of goods and services, produce and process information about investors and investment projects to enable efficient allocation of funds, monitor investments and exert corporate governance after these funds are allocated, and help diversify, transform and manage risk (Rajan & Zingales, 1998; Demirguc-Kunt, 2008).For sub-Saharan Africa countries, the lack of access to formal financial services is viewed as a significant impediment to financial deepening (Gulde, et al., 2006).

The determinants of financial development and its effect on growth and the development of the financial sector itself have been studied extensively. The main findings on these determinants from various literature can be summarized as follows. To begin with, Boyd et al., (2001) indicated in their cross sectional study that the level of inflation had a negative impact on financial sector development which was in line with previously reviewed literature which established that there was a negative and statistically significant relationship between banking sector development measures and the level of inflation after controlling other economic factors that may be associated with financial development. Again, they established that inflation was negatively correlated with market capitalization and domestic value traded; which indicates that higher inflation rates depress stock market development in the Latin American countries.(Acquah, 2005; Al-Nasser, O. & D. Jackson, 2012).

Again, the degree of capital account openness and the liberalization of domestic financial systems according to previous literature help develop the financial sector (Demirguc-Kunt, 1998; Chinn & Ito, 2002). According to previous literature concerning financial development and its determinants, La Porta et al, 1997, 1998; Beck& Levine, (2000) opined that a country's legal origin affected the financial deepening of countries. They put forward that the legal reforms affected both creditor rights and private credit, and the extent of creditor rights protection also has an independent effect on financial sector development as supported by other literature (Beck et al., 2003; Djankov et al., 2006). Mayer and Sussman, (2001) indicated that "regulations concerning information disclosure, accounting standards, permissible banking practices and deposit insurance do appear to have a material effect on financial development." Also, a country's geography and initial

endowment also influence the extent of financial sector development as put forward by Acemoglu, et al., (2002).

There is also a pool of evidence in the literature that find financial development to be important in driving economic growth in both developed and developing countries. The earliest theoretical arguments in support of the role of financial development were greatly put forward by Schumpeter (1911) and Hicks (1969). As postulated by Schumpeter (1911), the services provided by the financial intermediaries are important for innovation and the development of economies. Schumpeter also showed that financial institutions may spur innovation and growth by identifying and funding productive investments. The same view was held by Hicks (1969) who traced the critical historical role played by the financial system in igniting industrialization by facilitating the mobilization of capital for productivity.

The economic impact of financial sector development, among others, has been extensively documented and conclusions arrived at and support the fact that financial development is associated with greater growth across countries (King and Levine, 1993; Levine and Zervos, 1998; Beck et al., 2000). Similar confirmation also exists at the firm and industry levels (Demirguc-Kunt and Maksimovic, 1998 and Rajan and Zingales, 1998). Re-visiting the impact of financial development on economic growth, Beck, et al., (2004) have shown that financial development also leads to lower levels of poverty and inequality.

Motelle, ( 2008) indicated that the attainment of private sector led-growth greatly depended on the availability and accessibility of the needed funds to finance business projects which are important to foster economic growth.

Adenutsi (2002) posits that financial development indirectly promotes economic performance through the enhancement of savings mobilization by commercial banks which in turn, fuels growth in Ghana. However, international migrant remittances are highly significant to low-income, developing or emerging economies and constitute about 2 per cent of their gross domestic product (GDP) and 6.2 per cent of their imports which is seen as significant to economic growth in these countries (The World Bank, 2003; Adenutsi2011).

With regard to remittances as a focal point, the development of the financial sector promotes an open market competition among the financial institutions and the money transfer firms or operators resulting in the reduction of transaction costs and thereby pulling more remittances from the informal to formal channel as put forward by many economists and researchers.

Literature concerning issues of financial development assumes certain proxies that are used as a measure of the level or the depth of financial development in a lot of economies in various empirical studies. Previous literature mainly uses a variety of measures to proxy for financial development (Khan & Senhadji, 2000). Firstly, liquid liabilities of the financial system which is often measured by the ratio of broad money to a nation's gross domestic product (M2/GDP). According to literature, they are equal currency plus demand and interest bearing liabilities of banks and non-bank financial intermediaries divided by gross domestic product (GDP). It is considered as the broadest measure of financial intermediation and depth which includes three types of financial institutions: the central bank, deposit money banks, and other financial institutions. However, Pill and Pradhan (1995) asserted that the standard measures of financial development like the real interest

rates and the ratios like broad money to GDP can lead to imprecise, though not incorrect results since these indicators sometimes overlook the financial openness of a country and also might be likely to ignore the figures of public borrowings that are made from domestic financial systems.

Secondly, the ratio of the sum of demand of saving and foreign currency deposits to Gross Domestic Product (DEP/ GDP). It measures the ability of banks to attract financial savings and provides a liquid store of value. Literature also uses claims on the private sector divided by GDP (LOAN/GDP). Previous researchers measure the extent to which the private sector relies on banks to finance consumption, working capital, and investment. Finally, credit provided by the banking sector to GDP (CREDIT/GDP), which measures how much intermediation is performed by the banking system, including credit to the public and private sectors (Levine, 1997; IMF, 2000; Giuliano and Ruiz-Arranz, (2006 ).

More recently, credit to private sector has been favoured as the best alternative measure of financial sector depth or intermediation. The main advantage of this indicator, according to Khan and Senhadji, (2000) is that, by excluding credit to the public sector, it measures more accurately the role of the financial sector or intermediaries in channeling funds to the private sector. This measure is mostly deemed a fit proxy for financial development because unlike the other measures, the credits to private sector are more related to the ability of the financial system to provide transaction services which channel funds from savers to borrowers; and given that banks play a leading role in the supply of external finance in most developing countries, banking sector development in these countries is of key importance.

## 2.5 Remittances and Financial Development.

Today, the impact of remittances is recognized in all developing regions of the world, constituting an important flow of foreign currency to most countries and directly reaching millions of households, approximately 10 per cent of the world's population according to the World Bank, (2011). The importance of remittances to poverty alleviation is obvious and the potential multiplier effect on economic growth and investment is also significant. There is burgeoning evidence of the benefits of migrants' remittances on the recipient countries in various aspects of the economy. Spanning from education to health to entrepreneurship, remittances which according to previous but even recent empirical studies are seen as stable and less volatile and positively affects these above mentioned areas in the livelihoods of recipients. Literature has rarely touched on the nexus that remittances might have with financial development despite the recounted impacts, positively or negatively, of remittances on recipient developing economies.

Remittances may potentially contribute to the long-term growth through higher rates of capital accumulation among recipient countries. In the absence of an efficient financial system, as commonly seen in the developing economies, the untapped market with poor credit rating can potentially be approached by the inflow of remittances. Therefore, remittances may contribute to alleviate credit constraints by improving the allocation of capital, and therefore accelerating economic growth.

On the one hand, an economy that has well-functioning financial institutions and markets, that is considering a system that reduces the costs of conducting transactions and creating a greater level of awareness of available financial products and services, may help direct migrants' remittances to projects or investments that yield the highest return and therefore

enhancing economic growth rates through developed and deepening financial sectors. Another position considered contrary to the positive effect of remittances is that remittances might become a substitute for inefficient or the unavailability of credit markets by helping local entrepreneurs bypass lack of collateral, bureaucratic formalities or high lending costs and start productive activities (Glytsos, 2002; Chami et al.,2005). However, according to Aggarwal et al., (2005), the empirical analysis finds strong evidence that remittances boost growth in countries with less developed financial systems by providing an alternative way to finance investment and helping overcome liquidity constraints. This in turn, promotes financial development and finds evidence that remittances are associated with banking sector development across a broad set of countries such as Guatemala, El Salvador, Ecuador and Honduras and Mexico.

A contrasting point of view posits that more developed financial systems may seem to attract more remittances. That is, increase the volumes of remittance inflows through formal channels, which will incur lower transaction costs and fewer restrictions on payments. Giuliano and Ruiz-Arranz (2006) also find a positive correlation between the level of remittance flows and measures of bank deposits, but much weaker correlations between remittances flows and bank credit. Orozco and Fedewa (2007) investigated that households receiving remittances in five Latin American countries are more likely than non-recipient households to have bank accounts.

The relationship between remittances and financial development is basically founded on the notion that remittances can lead to financial development in developing countries. This assertion is based on the concept that money transferred through financial institutions or formal Money Transfer operators are even adopted by the financial institutions. This is

deemed to pave the way for recipients to demand and gain access to other financial products and services, which they might not have as put forward by Orozco and Fedewa, (2005). Aggarwal, (2005) indicated that remittances have a significant impact on bank deposit to GDP, suggesting that these flows do find their way into the formal system and get deposited in the banks. In the same sense, the provision of remittance transfer services by the financial institutions enables these financial institutions reach out to create acquaintances and relationship with unbanked recipients or recipients with limited financial intermediation. For example, remittances might have a positive impact on credit market development if banks become more willing to extend credit to remittance recipients because the transfers they receive from abroad are perceived to be significant and stable. However, even if bank lending to remittance recipients does not materialize, overall credit in the economy might increase if banks' 'loanable' funds surge as a result of deposits linked to migrants' remittances inflows" Orozco and Fedewa (2005).

Beck et al. (2000) illustrated that when a large proportion of population in the informal sector has no access to bank credit, it reduces their productivity and slows down economic growth. Again, in another study Beck et al (2004) used cross country data of 58 developed and developing countries to substantiate that there is poverty and inequality reduction effect of migrants or workers' remittances through financial development. That is to say, a less developed financial market hinders capital accumulation and economic growth. In contrast, Giuliano and Ruiz-Arranz (2005) indicate that the growth effect of remittances is stronger in countries where the financial sector is weaker while using a cross country data set of hundred (100) developing countries. They argued that migrants' remittances can compensate for the lack of access to credit suffered by recipients in countries with less developed financial sector.

The positive effect of financial development on growth as afore mentioned has been extensively documented (Levine, 1997; Beck et al, 2004) and studies that talk of the relationship between remittances and investment, where remittances either substitute for, or improve financial access, conclude that remittances stimulate growth (Giuliano & Ruiz-Arranz, 2005; Toxopeus &Lensink, 2006).

This research very much concentrates on the link between remittances and financial development in African countries since much work, theoretically and empirically, has been conducted in other economic issues in other developing countries. Also the importance of a well-developed and functioning financial sector on economic growth has been well documented in several influential studies (King and Levine, 1993; Levine, 1997, 2004; Levine and Zervos, 1998). The relationship between remittances and the financial sector development is important because some argue that intermediating remittances through the banking sector can magnify the developmental impact of remittance flows (Terry & Wilson, 2005, and World Bank, 2006).

Taking into consideration financial development in terms of domestic credit expansion, Mundaca, (2005) using data for Central America, Mexico and Dominican Republic, demonstrated that there existed an indirect effect of remittances on growth. Rao and Hassan (2010) confirm this finding in 40 high remittance recipient countries basically from the Latin America and The Caribbean. Using a System Generalized Methods of Moments panel data analysis they indicated that remittances indirectly facilitated economic growth by increasing the ratio of broad money (M2) to GDP as a proxy for measuring financial sector.

However, two studies that are quite recent in this field (Aggarwal et al., 2006; Gupta et al.,2009) unequivocally illustrated that there was a relationship between remittances and financial development which needed a closer study to further explain the nexus in parts of the African continent and other developing countries. Aggarwal et al. (2006) showed that a significant and positive relationship existed between remittances and bank deposit to GDP ratio and credit to GDP which was used as a proxy for financial development of ninety nine (99) developing countries, with the latter relationship being less robust. Again, the increasing and stable or less volatile flow of migrants' or workers' remittances significantly and positively facilitate and improve the financial sector's development in Sub-Saharan Africa as put forward by Gupta et al. (2009). To support these arguments, Norman and Uddin, (2011), in studying the South Asian economies posited that remittances enhance the development of banking sector in three ways. "Firstly, remittances supply the households with excess cash that might potentially generate a transaction demand for financial services. Secondly, the fees earned through remittance processing, can add to the profitability of a branch. Banks with the state of the art infrastructure can explore this new market opportunity. Thirdly, banks can target the 'bottom of the pyramid' segment of the remittance receiving market, where a substantial portion of the remittances is likely to remain unbanked."

In the empirical aspect, the nexus between remittances and financial sector development has been scantly explored, applying quite a number of diverse models and estimation techniques such as vector autoregression (VAR) and generalized method of moments (GMM) to cross-section, time-series, and panel data sets Aggarwal et al., (2006). In studying the impact of remittances on financial development Aggarwal identified the potential for endogeneity biases as a result of measurement error, reverse causation, and

omitted variables. In addressing the biases due to reverse causality, Aggarwal et al. (2006) run regressions lagging all regressors and conducted dynamic system Generalized Method of Moments (GMM) estimations which emulated Arellano and Bover (1995), using lagged regressors as instruments**.** Finally, they performed instrumental variables (IV) estimations to try to address, in a more direct manner, the potential endogeneity of remittances arising from measurement error, omitted factors, and/or reverse causation.

Using an unbalanced panel of forty four (44) countries and six time periods, composed of five year averages from 1975 to 2004, Gupta et al., (2009) found that remittances have a direct poverty-mitigating effect and a positive impact on financial development. Migrant transfers help ease the immediate budget constraints of recipient households, and provide an opportunity for small savers to gain a foothold in the formal financial sector.

In studying the relationships among remittances, financial development and growth, Giuliano and Ruiz-Arranz, (2006), their empirical analysis found strong evidence that remittances boost growth in countries with less developed financial systems by providing an alternative way to finance investment and helping overcome liquidity constraints. In studying the impact of remittances and financial development on economic growth, Giuliano and Ruiz-Arranz, (2006) controlled for inflation, measured as the annual percentage change in the consumption price index, openness to international trade, human capital, government fiscal balance and investment ratio and population growth. In their study, they also identified and addressed the endogeneity problem by using System Generalized Method of Moments regressions (SGMM), following Arellano and Bover (1995). However, in contrast, more developed financial systems seem to attract more

remittances. In other words, the volumes of remittance inflows increase with lower transaction costs and fewer restrictions on payments.

Recent studies by some researchers postulated that, the impact of remittances on growth can greatly depend on the level of financial sector development in the remittance recipient country. Nevertheless, these studies yielded results that did not converge at a similar conclusion. Giuliano and Ruiz-Arranz (2006) show that remittances help promote growth in less financially developed countries through making up for the lack of development of local financial markets by using remittances to ease liquidity constraints and to channel resources towards productive uses that foster economic growth. Mundaca (2005) found out that controlling for financial development supported the positive impact of remittances on growth and concluded that "financial development potentially leads to better use of remittances, thus boosting growth." However these studies as well as a few afore mentioned ones investigate the impact of remittances on financial development on developing economies, particularly countries in Africa. This paper contributes to the literature by directly addressing this issue, exploring the impact of remittances on bank deposits and credit to the private sector as a measure of financial development in African countries with high receipts of remittances as a ratio of GDP.

To concur these assertions, there is a burgeoning argument that remittances promote financial sector development through savings of remittances. As country-specific surveys indicate that while typically a large proportion of remittances are spent, the propensity to save from remittances among some households can be as high as 40% of the amount received (UNDP, 2005). However, there is also another assertion that financial sector deepening or financial development causes greater flow of remittances through formal

channels thereby lowering transaction costs through increased competition among financial institutions to attract remittances. From these contentions we are prone to claim that there could be a bi-directional causality between remittances and financial development, particularly in Africa.

### 2.5.1 Bi-Directional Causality between Remittances and Financial Development.

Bi-directional causality is also a major concern when examining the link between remittances and financial development, since greater financial development might lead to larger measured remittances either because financial development enables remittance flows or because a larger percentage of remittances are measured when those remittances are channeled through formal financial institutions. Financial sector growth in the remittance-receiving economy can potentially drive remittance inflows. In addition, financial development might lower the cost of transmitting remittances, leading to an increase in such flows. Some studies have tried to test for the existence and analyze the reverse causalities that may be between remittances and economic growth (Motelle, 2011), as this can occur either through effects on migration, in which case low economic growth leads to higher outward migration and higher remittances; or through altruistic behavior on the part of the existing migrant community, in which case low economic growth in the home country leads altruistic migrants to increase compensatory transfers.

Aggarwal, (2006) considered reverse causality when examining the link between remittances and financial development since “greater financial development might lead to higher remittances either because financial development enables remittance flows or because a larger percentage of remittances are accounted for when those remittances are channeled through formal financial institutions”. In addition, financial development might

lower the cost of transmitting remittances, leading to an increase in such flows. So then this research poses the question; "Do remittances promote financial development? Or does financial development propel the higher inflows of remittances?"

This research endeavours to find out a bi-directional causality between remittances and financial sector development as there exist one by Calderon and Liu (2003) between financial development and economic growth. The second reason for bi-directional causality is that financial sector deepening and remittance flows may both be affected by independent (not remittance-driven) causes. This could be poor domestic financial credit accessibility by locals, which may both motivate higher remittances and retard financial sector deepening or growth.

### 2.5.2 Remittances to African Countries during the Financial Crisis

The volatility or the inconsistency that may occur in the flow of remittances to developing countries are deemed to affect the pattern of growth in a recipient receiving and dependent economy. Remittances are then seen to be affected unfavourable financial events that may occur in a developed country or the host country of the migrant. The financial crisis that started in the 2007 in the United States of America resulted in devastating economic and social effects on both developed, emerging and developing countries. This development has elicited policy and research responses in the recent past across the world. At the beginning of the financial crisis there, many analysts indicated that Sub-Saharan African countries would be insulated or less impacted by financial down turn or crisis in the developed countries as a result of the region's low level of integration with the rest of the world. However, available evidence shows that these developing countries have witnessed reduction and changing structure of short-term capital inflows from international aiders

from foreign countries, and worsening of commodity prices on the markets of the developed countries (Allen & Giovanneti, 2010), and declining equity returns (Nyamongo & Misati, 2010).

Further evidence has pointed out that these economies were partially rescued from the full effects or impacts of the financial crisis by resilient migrants' remittances though there was a decline in the levels of monies remitted to developing countries. The reduction in remittance inflows during the financial crisis were due to the reduced ability of the migrants to send money to their home countries and again return migration as migrants who lost jobs were forced to return to their countries of origin. Until the financial crisis, remittances had proven to be a remarkably dependable source of foreign income for African countries. However, some studies show that remittance flows were less affected than other private capital flows and recovered quickly from a 5.4% decline in 2009 (Mohaapatra et al., 2011).

Again, using data on the distribution of migrants from Africa, GDP growth forecasts for host countries, and after estimating remittance multipliers in recipient countries, Barajas et al., (2010) estimated the impact of the global economic crisis on African countries' GDP via the remittance channel during 2009-2010. Their paper forecasted that remittances sent into African countries declined between 3 and 14 percentage points, with migrants to Europe hardest hit while migrants within Africa relatively unaffected by the crisis. The estimated impact on GDP for relatively remittance-dependent countries was 2 percent for 2009.

This paper is at the crossroads of two strands of literature. The prime motive is the impact of remittances on the financial sector development of developing countries or economies and specifically in Africa. This research tries to find out whether remittances promote financial development in emerging economies. Though some conclude that remittances support financial development and thus economic growth, others conclude on the dampening effect of remittances on economic growth because they allow the recipient to go around financial intermediations and make investments. Other literature is of the complementary view of remittances and financial development. The complementary hypothesis is built on the notion that remittances and financial development support one another (Aggarwal et al., 2010 and Martinez et al., 2007).

This research delves into finding whether remittances promote financial development in developing countries and then tries to find the nexus and directions of causality between financial development and remittances in Africa. Using econometric techniques applicable to panel data, this research intends to address the above stated gaps already discussed. This is justified since the study considers countries in Africa with a remittance to GDP ratio equal to or higher than 1.0%. This threshold is deemed to significantly affect economic issues in recipient countries. This aids the researcher in the selection criteria for countries to be included in the sample.

# CHAPTER THREE

# METHODOLOGY

## 3.0 Introduction

This chapter describes the research methodology. It identifies the type of study to be carried out, the research methodology and the reasons for such a methodology. Besides, this chapter unveils details and justifies the methods to be followed in achieving the set objectives of the study. The chapter begins with the specification of the model for the study then goes ahead with the definition of the variables specified in the model. Justification for the variables employed is therefore explained. The sample and sources of data for the study are then explained and finally data analysis tools and techniques are detailed.

## 3.1 Model Specification

The research seeks to empirically find out if remittances do promote financial development of countries in the African continent considering regional differences for a period from 1990 to 2012. This then assumes the use of panel analytical methods to achieve the set objectives. The importance of understanding the factors behind the time series variation in financial development, alongside those that shape the cross-country variation, cannot be over emphasized. Given the importance of the time-series variation in financial development in modern times, an empirical investigation into its determinants must be able to account for its variation both across countries and over time. We therefore utilise panel data techniques to shed light on the effects or contributions, if any, of remittances on financial sector development and a reverse causation in these developing countries of Africa.

Panel data estimation tends to produce more convincing findings than cross section analysis and classical time series analysis since it exploits both the cross section and time dimensions of the data. It allows us to control for unobserved country-specific effects and omitted variables bias, and look at both long-run and short-run effects (Stock & Watson, 2001).

The general form of a panel data model is $Y_{it} = \alpha_i + \gamma_t + \beta X_{it} + \varepsilon_{it} ----------(1)$

Where:

Subscript i denotes the cross sectional dimension (country) $i = 1. . . N$ and t denotes the time series dimension (time), $t = 1. . .T;$

$Y_{it}$ is the dependent variable.

$\alpha_i$ is scalar and constant for all periods (t) and specific to country fixed effect ($i$)

$\gamma_t$ is the time fixed effect

$\beta$ is a $k \times 1$ vector of parameters to be estimated on the explanatory variables or the factor loadings or parameter estimates for the explanatory variables.

$X_{it}$ is a $1 \times k$ vector of observations on the explanatory variables comprises the explanatory variables in the model which may include controlled variables:

$\varepsilon_{it}$ which is iid is the error term.

The research seeks to establish a link between remittances and financial development, as to how remittances do promote financial sector development. One important aspect as posited by other literature in empirically studying the impact of remittances on financial development is the potential for endogeneity biases as a result of measurement error, omitted variables and reverse causation. Officially recorded remittances are known to be

measured with error as data on remittances tend to record more accurately remittances sent via banks and not those sent via non-bank institutions such as money transfer operators.

The argument of reverse causality is also a concern when examining the link between remittances and financial development. This is possible because greater financial development might lead to larger measured remittances either because financial development enables remittance flows or because a larger percentage of remittances are measured when those remittances are channeled through formal financial institutions. In addition, financial development might lower the cost of transmitting remittances, leading to an increase in such flows (Aggarwal et al., 2011).

The use of the Ordinary Least Square (OLS) estimator is not deemed fit for the estimation of the parameters in our panel regression model. This is primarily because the assumptions of the OLS are violated given the data available for the study. Again the reason for the use of other estimation techniques other than the Ordinary Least Squares is because the independent variable, remittances, is seen as endogenous to the model, creating biased estimates should the OLS be used.

According to Arellano, Manuel, Bover and Olympia, (1995), a regressor is endogenous if it is not orthogonal to the error term. That is, if it does not satisfy the orthogonality condition. With an intercept in the equation, endogeneity arises if and only if the regressor is correlated with the error. From this point of view the normal assumptions of the Ordinary Least Square Estimator will be violated. To estimate this model by OLS, the usual conditions are required to achieve unbiasedness, consistency or efficiency. The major conditions for the OLS estimator are that the average of the error term should be

equal to zero $E\{\varepsilon_{it}\}=0$ and uncorrelated with the regressor $E\{x_{it}\varepsilon_{it}\}=0$. Again the data should satisfy the assumption of homoskedasticity. With remittances being endogenous, the basic OLS estimations will produce biased estimations, therefore the use of an alternative method.

Another method of estimation that can be used for panel data analysis is the system generalized method of moments of Blundell and Blond (1998) for dynamic panel data. The system GMM has been proven to be more efficient with short time series. The system GMM considers the differencing of the variables using a few lags. One of the limits of this estimator is the asymptotic weakness of its precision and that of the instruments which involve considerable bias in finite samples.

This paper in achieving its objective of establishing the link between remittances and financial development in Africa therefore uses a priori fixed and random effect estimations to establish the existence of this relationship. This is to allow each country to be treated individually to adjust for events such as civil wars and government transitions and to account for the factor of changing time and its effects on financial development in each country.

The estimation model is thus:

$$FD_{it} = \alpha_i + \beta_1 \mathrm{Re}\, m_{it} + \beta_2 Loggdp_{it} + \beta_3 Pcgdp_{it} + \beta_4 Inf_{it} + \beta_5 Fdi_{it} + \beta_6 Exp_{it} + \varepsilon_{it} \ldots\ldots\ldots (2)$$

There exists a simultaneity effect that results from the independent variable, remittances, being endogenous to the model. The paper then, considering other estimation techniques, will use a Structural Panel Vector Auto regression (PVAR) model which combines the

traditional vector auto regression with a panel data approach while allowing for some variables to be held constant as control variables. This paper seeks to address the potential endogeneity that is deemed to arise since remittances; an independent variable may be correlated with the dependent variable with much concentration on the existence of reverse causality. This technique is considered useful when no reliable natural experiment can be used to establish causality. This perhaps explains why VARs are usually associated with macro econometrics (Stock and Watson, 2001). The specified model for the vector autoregression is as below.

$$FD_{it} = \alpha_i + \sum_{j=1}^{k} \beta_{1j} FD_{it-j} + \sum_{j=0}^{k} \beta_{2j} \operatorname{Re} m_{it-j} + \sum_{j=1}^{5} \beta_{3j} X_{itj} + \varepsilon_{it} \text{ -----(3)}$$

$$\operatorname{Re} m_{it} = \alpha_i + \sum_{j=1}^{k} \lambda_{1j} FD_{it-j} + \sum_{j=0}^{k} \lambda_{2j} \operatorname{Re} m_{it-j} + \sum_{j=1}^{5} \lambda_{3j} X_{itj} + \varepsilon_{it} \text{ -----(4)}$$

Where *i* refers to the country and *t* refers to the time period from 1990 to 2012. The study conducts preliminary test to test for the long run relationship that may exist between remittances and financial development. The Autoregressive Distributive lag method and Johansen cointegration test is used in checking this relationship. Prior to this, the overall stationarity of the panel data will be tested using the Augmented Dicker Fuller (ADF) test and the Philips Peron (PP) test for unit root.

Upon verification of the existence of a long run relationship, the study then adopts the Vector Error Correction Model (VECM) which is suitable for endogenous variables that have long run relationship. In order to help determine the directions of causality between remittances and financial development, the researcher then adopts the VECM on a panel data which then is described as the Panel Vector Error Correction Model (PVECM). The study mainly uses the Akaike Information Criteria (AIC) and the support of other selection

criteria to find the appropriate number of lags effective for the study. *j* refers to the time lag and k refers to the maximum number of lags.

*FD*, financial development, is proxied by the ratio of bank credits to private sector (CRD) as expressed as a percentage of GDP, bank deposits (BDP) and the level of broad money or money supply (M2) as a percentage of GDP in the countries under study. *Rem* refers to the ratio of remittances to GDP. Here, we hypothesize that higher level of remittances will occasion higher financial development as was found in Aggarwal et al. (2006) where it was shown that higher financial development tends to be associated with higher remittances. *X* refers to a set or vector of variables that previous literature has found to promote or affect financial development.

These variables are a vector of controls following previous researches which are identified to include: GDP per capita, Inflation - defined as the percentage change in the GDP deflator; Exports to GDP, the share of total exports as a percentage of GDP; FDI inflows to GDP, foreign direct investment expressed as a percentage of GDP. $\beta$ and $\lambda$ are the correlation coefficients, which those of the remittances variable *Rem* in equation (2) and the lags of financial development as a variable in equation (3), respectively, are expected or hypothesized to be positive to indicate a bi-directional causal effect. $\alpha$ being the country specific effect and $\varepsilon$ being the error term.

Model 1

$$CRD_{it} = \alpha_i + \sum_{j=1}^{k} \beta_{1j} CRD_{it-j} + \sum_{j=0}^{k} \beta_{2j} \mathrm{Re}\, m_{it-j} + \sum_{j=1}^{5} \beta_{3j} X_{itj} + \varepsilon_{it} \quad -----(a)$$

$$\mathrm{Re}\, m_{it} = \alpha_i + \sum_{j=1}^{k} \lambda_{1j} CRD_{it-j} + \sum_{j=0}^{k} \lambda_{2j} \mathrm{Re}\, m_{it-j} + \sum_{j=1}^{5} \lambda_{3j} X_{itj} + \varepsilon_{it} \quad -----(b)$$

Model 2

$$BDP_{it} = \alpha_i + \sum_{j=1}^{k} \beta_{1j} BDP_{it-j} + \sum_{j=0}^{k} \beta_{2j} \mathrm{Re}\, m_{it-j} + \sum_{j=1}^{5} \beta_{3j} X_{itj} + \varepsilon_{it} \quad -----(c)$$

$$\mathrm{Re}\, m_{it} = \alpha_i + \sum_{j=1}^{k} \lambda_{1j} BDP_{it-j} + \sum_{j=0}^{k} \lambda_{2j} \mathrm{Re}\, m_{it-j} + \sum_{j=1}^{5} \lambda_{3j} X_{itj} + \varepsilon_{it} \quad -----(d)$$

Model 3

$$M2_{it} = \alpha_i + \sum_{j=1}^{k} \beta_{1j} M2_{it-j} + \sum_{j=0}^{k} \beta_{2j} \mathrm{Re}\, m_{it-j} + \sum_{j=1}^{5} \beta_{3j} X_{itj} + \varepsilon_{it} \quad -----(e)$$

$$\mathrm{Re}\, m_{it} = \alpha_i + \sum_{j=1}^{k} \lambda_{1j} M2_{it-j} + \sum_{j=0}^{k} \lambda_{2j} \mathrm{Re}\, m_{it-j} + \sum_{j=1}^{5} \lambda_{3j} X_{itj} + \varepsilon_{it} \quad -----(f)$$

**Table 3.1. Definition of variables.**

| | |
|---|---|
| **$FD_{it}$** is the financial development of country *i* at time *t*. | The ratio of credit to private sector to GDP(CRD), bank deposit to GDP(BDP) and money supply (M2) to GDP |
| **$Rem_{it}$** is the level of remittances of country *i* at time *t* | The ratio of official remittances received as a percentage of gross domestic product. |
| **$LogofGdp_{it}$** is the natural log of gross domestic product in constant US dollars. | The size of the economy is captured by the log of GDP in<br>constant United States dollars. |
| **$PCGdp_{it}$** is the per capita gross domestic product of country *i* at time *t*. | Per capita GDP is the gross domestic product divided by the population of each country, measured in constant dollars. |
| **$INF_{it}$** if the level of inflation of country *i* at time *t* | Inflation is the change in the gross domestic product deflator |
| **$Exp_{it}$** is the total export of country *i* at time *t*. | The measure level of current account openness |
| **$FDI_{it}$** is the level of foreign direct investment of country *i* at time *t*. | This measures for current and capital account openness in the recipient country. |

The above models Equations (3) and (4) can be seen in a matrix format as below:

$$\begin{bmatrix} FD_{it} \\ \text{Re}\, m_{it} \end{bmatrix} = \begin{bmatrix} \alpha_i \\ \alpha_i \end{bmatrix} + \sum_{j=1}^{k} \begin{bmatrix} \beta_{1j} & \beta_{2j} \\ \lambda_{1j} & \lambda_{2j} \end{bmatrix} \begin{bmatrix} FD_{it-j} \\ \text{Re}\, m_{it-j} \end{bmatrix} + \begin{bmatrix} \beta_{31}\beta_{32}\beta_{33}\beta_{34}\beta_{35} \\ \lambda_{31}\lambda_{32}\lambda_{33}\lambda_{34}\lambda_{35} \end{bmatrix} \begin{bmatrix} X_{it1} \\ X_{it2} \\ X_{it3} \\ X_{it4} \\ X_{it5} \end{bmatrix} + \varepsilon_{it} \text{------(5)}$$

This matrix above can be compressed into a simple equation as illustrated below:

$$Y_{it} = \alpha_{it} + \sum_{j=1}^{k} \text{B}_j Y_{it-j} + \text{B}_3 X_{it} + \xi_{it} \text{----------(6)}$$

This research is deemed to contribute to the literature on financial development and remittances in several ways. First of all, by using panel vector auto regressions, the researcher is able to consider the complex relationship between remittances received by developing countries and the financial depth or development situation of these countries, while allowing for a country-specific unobserved heterogeneity in the levels of the variables (i.e. fixed effects).

## 3.2 Definition and Justification of Variables

### 3.2.1 Dependent Variables.

Financial development can be described as the growth and robustness of financial sector and intermediary services in any given economy. It may consist of the existence of adequate and competitive banking sector, vibrant stock markets and even the literacy of the existence and usage of these financial sectors and intermediary services in creating greater wealth. In line with previous literature, financial development has been proxied by either the share of bank deposits or as a ratio of bank credit to the private sector expressed as percentages of Gross Domestic Product (GDP).

King and Levine (1993) use a measure of gross claims on the private sector divided by GDP, which includes credits issued by the monetary authority and government agencies. Levine (1999) used a measure of money bank credits to the private sector divided by GDP, which does not include credits to the private sector by non-money banks. Furthermore, as De Gregorio and Guidotti (1995) argued credit has a clear advantage over measures of monetary aggregates such as M2 or M3, in that it more accurately represents the actual

volume of funds channeled into the private sector. Therefore, the ratio of bank credit to the private sector to GDP is more directly linked to investment and economic growth.

Most of the countries are still completely relying on their banking sector rather than financial markets (Demetriades et al., 2008). This study aims mainly at concentrating on indicators for development in the banking sector. The reason for this focus is the direct role of banks in channeling foreign remittances to the recipients of the home country. It is therefore expected that the volume of remittances have an immediate influence on banks' ability for credit expansion.

Again, this proxy is deemed suitable for this research as most African countries have less developed financial markets. Furthermore, most remittances that are used for accountability purposes are recorded from financial institutions which offer credit to the private sector and accept deposits as well. However, this research intends to include a measure of money supply, quasi money, M2, which is M1 plus savings and small time deposit. This measure is deemed efficient in this research due to the less adoption of the formal banking system in most African countries. For the greater significance of the research, the researcher intends to consider all African countries that have their remittance to GDP ratio to be above one (1) per cent.

### 3.2.2 Independent Variables.

Remittances can be defined as the total of migrant's fund transfers that are sent to his home of origin from his or her migration host country. Previous studies have generally used a broad definition of remittances that include the following three items in the IMF's Balance of Payment Statistics Year book (BOPSY). These are: workers' remittances,

compensation of employees, and migrant transfers. This research intends to inculcate the recent compilation of remittances data by the World Bank. Literature has recently computed new data that accurately defines the components of remittances which support the period under study since the potential for measurement error should be smaller in this period. Here, remittance statistics are likely to have improved over time hence the use of more recent years. According to the World Bank, (2013) remittances are defined as follows:

**Workers' remittances:** Current private transfers from migrant workers who are considered residents of the host country (i.e. non-residents of the home economy) to recipients in the workers' country of origin. If the migrants live in the host country for one year or longer, they are considered residents, regardless of their immigration status.

**Compensation of employees:** Earnings by resident individuals (i.e. residents of the home economy) for work performed in another economy (i.e. working in host) and paid for by residents of this other economy. If the migrants have lived in the host country for less than one year, their entire income in the host country is classified as compensation of employees.

**Migrants' transfers:** The net worth of migrants' assets that are transferred from one country to another at the time of migration (for a period of at least one year). This includes the flow of goods and changes in financial items that occur with migration (to or from the migrant as resident to the same person as non-resident).

### 3.2.3 Control (Independent) Variables

The regressions also include the following control variables. These control variables are deemed to actually contribute to the development of the financial sector in most countries and especially those selected for the study in Africa.

- **Log of GDP** is the representation of the country size which is controlled in the model. Relative to GDP, remittances are especially high among low-income, small countries such as Lesotho. This variable is included on the grounds that financial sector development requires paying fixed costs that become less important the larger the size of the economy and the richer the country as according to Aggarwal et al., (2006).

- **Per capita GDP** is a proxy for the degree of institutional development and quality of legal institutions which is postulated according to previous literature to have a positive impact on the levels of financial sector development in developing countries (Beck et al., 2000; Demirguc-Kunt et al, 2003; Djankov et al, 2007).

- **Inflation** is measured as the annual change in the gross domestic product deflator which follows studies of Aggarwal (2006).A substantial amount of literature suggests that inflation presents deleterious effects on financial development at the time of most studies. The main implication of the results is that poor macroeconomic performance has detrimental effects on financial development. Studies have shown that inflation distorts economic agents' decision-making regarding nominal magnitudes, discouraging financial intermediation, and promoting saving in real assets (Boyd, Levine, and Smith, 2001). Following other similar studies on the effects of inflation on financial development, we

also hypothesize that the coefficient of inflation is to exhibit a negative effect on the dependent variable.

- **Exports to GDP** is defined as the share of total exports as a percentage of Gross Domestic Product. Literature has used this measure as a proxy for the level of current and capital account openness in various developing countries. Current and capital account openness has also been found to have a positive effect on financial development (Chinn and Ito, 2002). We control for the share of exports to GDP instead of the ratio of exports plus imports because as Aggarwal et al., (2006), we are concerned with how trade openness can result in an increase in reserves, thus a potential for financial sector development in Africa. While exports can lead to such an increase in reserves, we do not expect imports to do so. Because this last variable is available for fewer countries, in most tables we include regressions with and without this variable.

- **Foreign Direct Investment (FDI)** and development assistance to GDP serve as a measure of openness and a measure for capital inflow ratios. This, according to previous research on the financial development levels of various developing countries, are deemed to promote the depth and breadth of the financial sector of recipient countries (Aggarwal et al., 2006). Following the works of Aggarwal, (2005) and Gupta et al., (2006), this work uses the sum foreign direct investment as a major measure of capital openness in developing and emerging countries in Africa. The use of official development assistance to GDP and percentage of portfolio inflows to GDP as measures of openness in recipient countries is not warranted and as such, not used in this study. Aggarwal et al, (2006) indicated that these measures had no correlation with either bank deposits to GDP or bank credit to private sector to GDP as measures of financial development.

**Table 3.2: Expected Summary of Variables**

| VARIABLE | SYMBOL | EXPECTED SIGN COEFFICIENT |
|---|---|---|
| Financial Development and its lags | $\mathbf{FD_{it}}$, $\mathbf{FD_{it-j}}$ | +/- |
| Remittances and its lags | $\mathbf{Rem_{it}}$, $\mathbf{Rem_{it-j}}$ | +/- |
| Log of GDP | **LOGGDP** | + |
| Per Capita GDP | $\mathbf{PCGDP_{it}}$ | + |
| Inflation | $\mathbf{INF_{it}}$ | - |
| Exports | $\mathbf{EXP_{it}}$ | + |
| Foreign Direct Investment to GDP | $\mathbf{FDI_{it}}$ | + |

### 3.3 Sources of Data

The World Bank Migration and Remittances Fact book is one of the most widely used sources of remittances data. This dataset defines remittances as the sum of workers' remittances, compensation of employees, and migrants' transfers. While these are three different series, research suggests that compilers of data find it cumbersome to distinguish between these series and tend to mix them. This happens even where the differences are clear in the manual of the International Monetary Fund (IMF). The World Development Indicators (WDI) is the prime source for data needed to undertake this study. This is found to be convenient since most research have used such sources and surveys are conducted to update these data.

De Luna Martinez (2005) reports that balance of payment statistics produced by developing countries often neglect remittances received via money transfer operators and almost always exclude those transferred via informal means such as hawala operators,

friends, and family members. We use 1990-2011 in order to obtain estimates of the impact of remittances over the last decade to account for the fact that recent remittances data are likely to be more accurate relative to statistics from the beginning of the sample, when less attention was given to these types of flows.

# CHAPTER FOUR

# ANALYSIS AND DISCUSSION

## 4.0 Introduction

This chapter discusses the data, analysis and findings of the study. The chapter discusses the current trend of the flow of remittances to the African continent as well as descriptive statistics of the other variables used in the study. The relationships between the variables are included while discussing the empirical findings of the econometric models stated in chapter three. In this chapter, robustness checks with other estimations techniques are made on the empirical estimations to check for the consistency of the empirical findings when alternative estimation techniques are used.

## 4.1 Remittances and Financial Development in Africa

The impact of remittances on financial development cannot be over emphasized. This notwithstanding, there is a weighty importance to consider. Research looking at the nexus between remittances and financial development indicates that the full impacts of remittances are faintly perceived as most of the remittances received are through informal means which are therefore not captured by the records of receiving countries. In this regard, this research uses recorded remittances that are available for analysis from the World Development Indicators (World Bank) and the International Monetary Fund (IMF) database. There are no valid estimations to capture the amount of remittances received via informal or unofficial means. This research therefore uses only recorded remittances. Using an unbalanced panel of 51 countries and twenty two time periods, from 1990 to 2011 as well as a panel vector autoregression while controlling for some variables, this

research investigates the effect of remittances on financial development in African countries.

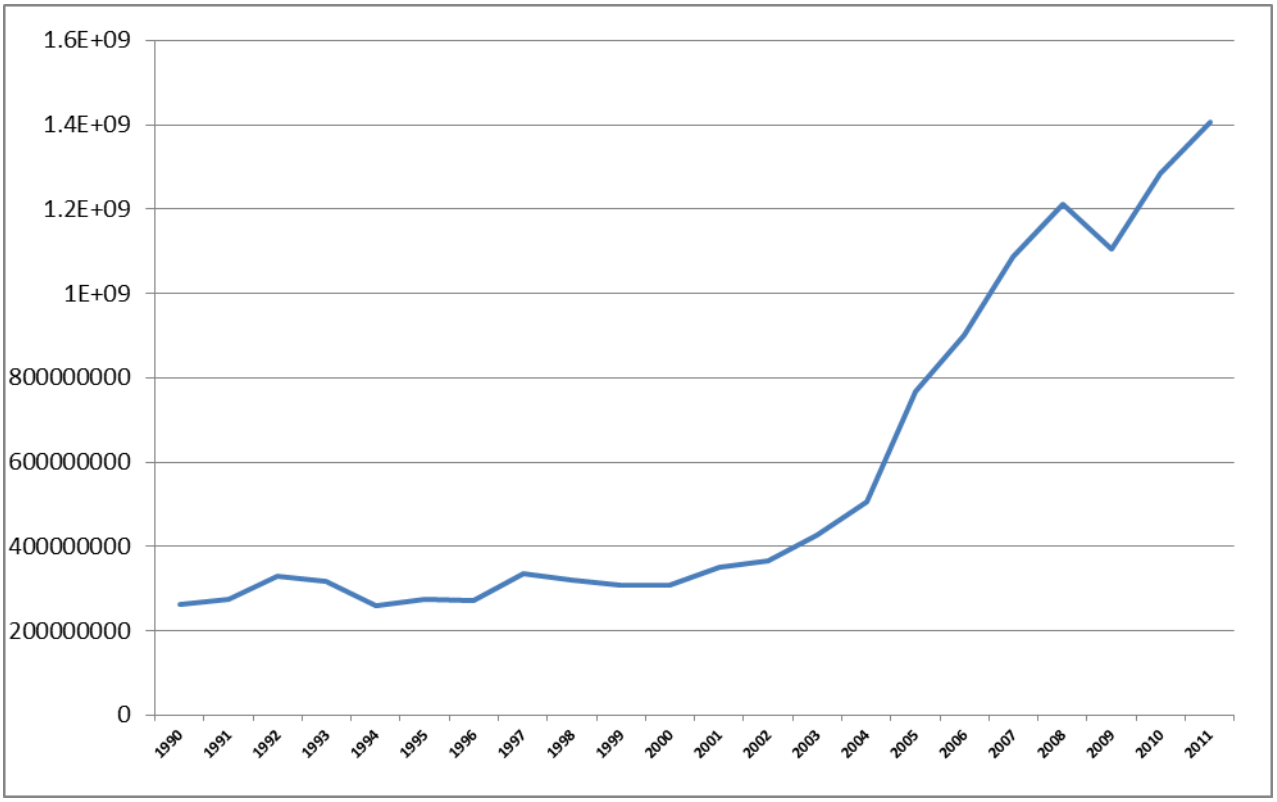



**Fig 4.1 Remittance Inflows to African countries between 1990 and 2011 (averaged constant dollars)**

**Source:** *Computations from Research Data, 2014*

### 4.2 Trend of Remittances to Africa.

Countries in the African continent like other developing countries in Asia, the Latin America and the Caribbean have for the past years seen a rise in the amounts of remittances received from developed countries and other developing countries that are within Africa. Despite the dominance of remittances over official development assistance in the region, official remittances to Africa have for the past years seen some falls over the period under study. Nevertheless, remittances are seen to have a steady rise over the years. This is very evident from Figure 4.1 above which is the average of remittances to

the countries used in the study over the 22 year period. Remittances are seen as less volatile due to the fact that the other inflows are counter-cyclical, that is they fold back when economic conditions are unfavourable. From the data, average remittances to African countries have grown over US $ 250 million in 1990 to over US $ 1.4 billion in the year 2011. From the figure above, remittances are seen to have had an increasing rise over the years but a fall was seen in the year 2008 and 2009 which could be explained by the years' financial downturn in most developed countries from where most remittances are received. This could have been as a result of employee layoffs in most remittance sending countries.

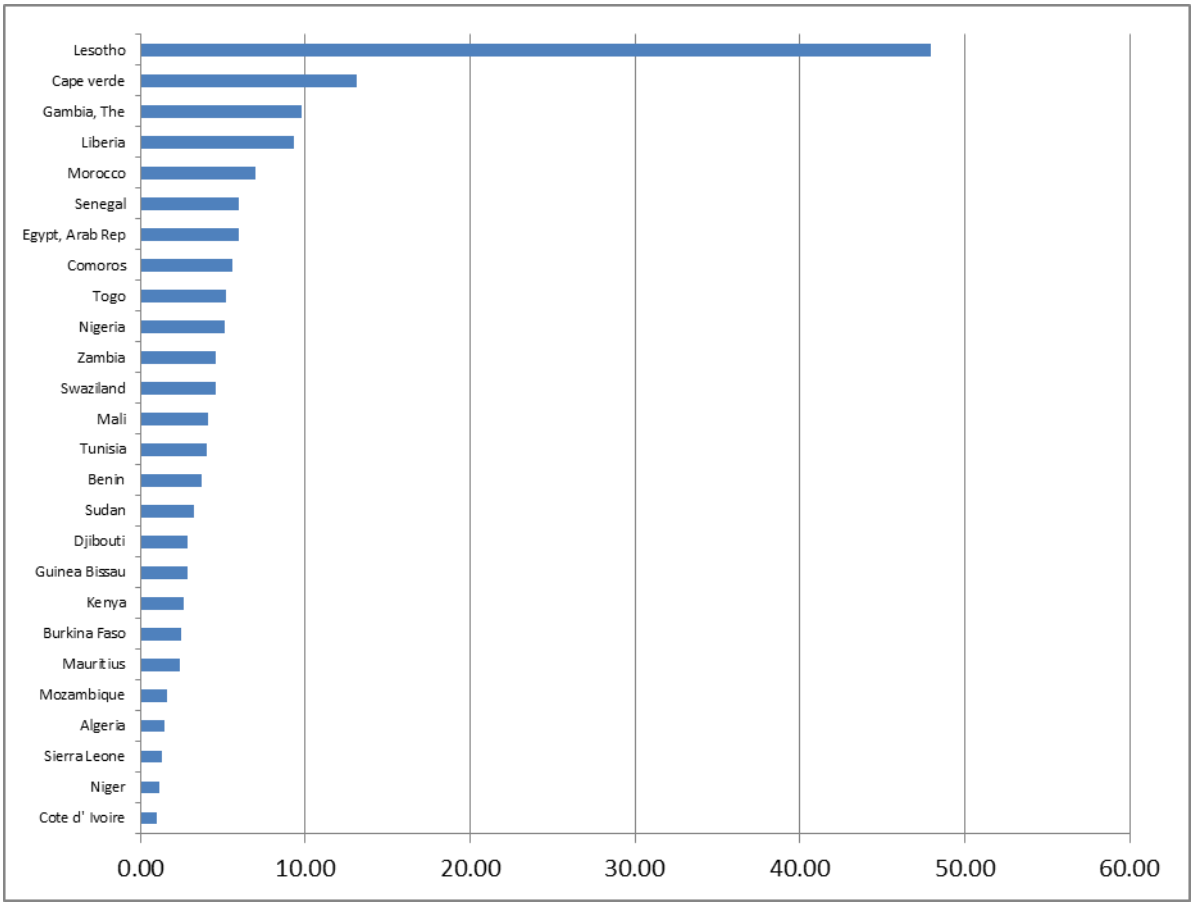



**Fig 4.2. 26 recipients of remittances % of GDP greater than 1.0% in Africa, 1990–2011 (average). Source:** *Computations from Research Data, 2014*

Figures 4.2 and 4.3 show the top ten remittance recipient countries in the sample based on averages for the period 1990 –2011, measured both as a proportion of GDP and in billions of U.S. dollars respectively. From fig. 4.3, Nigeria (US $ 6.4 billion) tops the recipients of remittances in terms of US dollars. Egypt (US $ 5.27 billion), Morocco (US $ 3.62 billion), Tunisia (US $ 1.10 billion), Sudan (US $ 0.89 billion) Algeria (US $ 0.83 billion and Senegal (US $ 0.55 billion) are among the largest recipients of remittances in absolute terms as shown in Fig. 4.3. Relative to GDP, remittances are especially high among low-income, small economies such as Lesotho (47.95 %), Cape Verde (13.11 %), Gambia (9.78 %), Liberia (9.34 %) and Morocco (6.98 %).

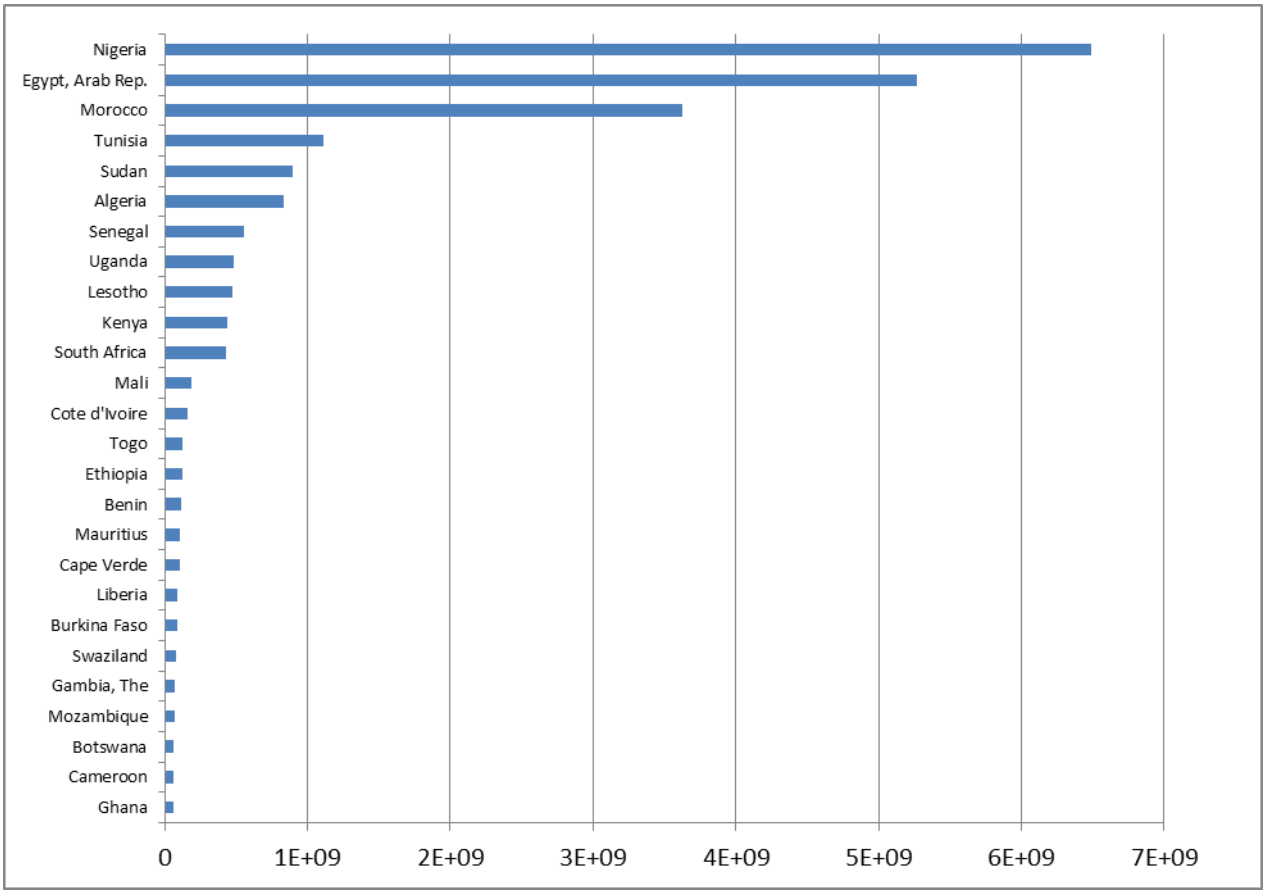



**Fig 4.3 Top Remittances in Africa Averaging 22 years (1990-2011) ($US).**

**Source:** *Computations from Research Data, 2014*

The figure above shows countries in Africa that are above the fiftieth percentile of all remittance receiving countries. With reference to remittances as a percentage of gross domestic products (GDP) of the sampled countries, about half of these countries receive remittances less than 1.00 % of their GDP. Botswana (0.987 %), Rwanda (0.916 %), Burundi (0.688 %), Zimbabwe (0.534 %), Ghana (0.464 %), South Africa (0.202 %) and Tanzania (0.139 %) are among the low remittance receiving countries as a percentage of their GDP and are thus below the fiftieth percentile.

**Table 4.1 Descriptive Statistics of the Data**

| Variable | Obs. | Mean | Median | Std. Dev. | Min | Max | Shapiro Wilk |
|---|---|---|---|---|---|---|---|
| CRD | 996 | 27.1761 | 19.5365 | 22.2356 | -0.0019 | 201.5771 | 11.43*** |
| BDP | 997 | 23.5619 | 16.9534 | 19.1251 | 0.7152 | 144.6355 | 11.42*** |
| M2 | 1022 | 32.9913 | 24.3781 | 23.6300 | 0.8306 | 151.5489 | 11.82*** |
| REM | 821 | 4.0119 | 1.6503 | 8.3421 | 0.0002 | 78.5704 | 13.96*** |
| LOGGDP | 1071 | 9.6751 | 9.6611 | 0.6779 | 8.0994 | 11.6040 | 4.352*** |
| PCGDP | 1071 | 1346.213 | 513.3625 | 2204.502 | 64.8101 | 23511.28 | 14.24*** |
| INF | 1046 | 30.6025 | 7.3539 | 234.2625 | -10.0088 | 5399.526 | 15.89*** |
| FDI | 1042 | 3.4696 | 1.7108 | 5.7311 | -6.8976 | 60.2826 | 13.76*** |
| EXP | 1057 | 29.8862 | 27.1386 | 16.3537 | 1.9457 | 91.5139 | 8.724*** |

****** 1% significance level***

*Source: computations from Research Data, 2014*

Table 4.1 shows the descriptive statistics of the variables that are concerned to affect financial development. The table also shows the results of the Shapiro-Wilk (S-W) normality test performed to test the normality of the variables. The Shapiro-Wilk (S-W)

normality test at default bears the null hypothesis that the data is normally distributed. However the results shown in the table 4.1 above show significant S-W values which indicate that we reject the null hypothesis of the test and therefore, data is not normally distributed. The table exhibits that the various variables have varying numbers of observations due to the unbalanced nature of the panel data that are used in the estimations. Granted that the data spans across fifty (50) countries and over 22 years, missing data points could be said to be inevitable.

**Table 4.2 Correlation Matrix: Test of Multicolinearity**

| | CRD | BDP | M2 | REM | LOGGDP | PCGDP | INF | FDI | EXP |
|---|---|---|---|---|---|---|---|---|---|
| CRD | 1 | | | | | | | | |
| BDP | .772** | 1 | | | | | | | |
| M2 | .676** | .822** | 1 | | | | | | |
| REM | .021 | .125** | .137** | 1 | | | | | |
| LOGGDP | .375** | .366** | .355** | -.140** | 1 | | | | |
| PCGDP | .152** | .243** | .226** | -.105** | .377** | 1 | | | |
| INF | -.025 | -.070* | -.044 | -.024 | -.012 | -.036 | 1 | | |
| FDI | -.071* | .023 | .058 | .260** | -.069* | .049 | .039 | 1 | |
| EXP | .105** | .170** | .083** | .060 | .140** | .477** | .004 | .226** | 1 |

** Correlation is significant at the 1% level (2-tailed), * correlation is significant at the 5% level (2 tailed).

Table 4.2 shows the correlation matrix between the various variables under study. The table mainly exhibits the Pearson's correlation which serves as a test for the collinearity of each variable compared with the other variables needed to achieve the set objectives. The research sets a threshold of 0.5 of the Pearson's correlation to be considered as the existence of high collinearity between a variable and other variables. From the table, it is seen that none of the variables but the three measures used as proxies for financial development, namely, credit to private sector to GDP (CRD), bank deposits to GDP (BDP) and quasi money to GDP (M2) exhibit multicollinearity among one another. However, these proxies are never used together in a single regression model which could have created biases in the results due to multicollinearity.

As mentioned the study also finds a high positive correlation greater than 0.5 between the three measures of financial development. The correlation between these variables being strongly positive but less than 1 suggests that these variables are different in themselves but the behaviour of pattern between them is to a greater extent similar or that these variables are generated from the other. Bank credit to the private sector as a percentage of GDP could be said to be derived from bank deposits which are both measures of financial development.

This research seeks to investigate the link between remittances on financial development in African countries using an unbalanced panel of 50 countries from 1990 to 2011. The baseline estimations specification adopted closely follows: Aggarwal, et al., (2010).

$$FD_{it} = \alpha_i + \beta_1 \mathrm{Re}\, m_{it} + \beta_2 Loggdp_{it} + \beta_3 Pcgdp_{it} + \beta_4 Inf_{it} + \beta_5 Fdi_{it} + \beta_6 Exp_{it} + \varepsilon_{it} \ldots\ldots\ldots (1)$$

The baseline estimation is specified from the above model. Throughout this study, the dependent variable, financial development is alternatively proxied by credit to private as a percentage of GDP, bank deposits as a percentage of GDP, and the ratio of quasi money (M2) to GDP. Remittances are measured in relation to a recipient country GDP. The regressions also include the following control variables:

- The size of the economy is captured by the log of GDP in constant United States dollars.
- Per capita GDP is a proxy for the degree of institutional development.
- Inflation is measured as the change in the gross domestic product deflator.
- The ratio of exports to GDP proxies current account openness.
- The sum of Foreign Direct Investments and development assistance to GDP serves as an alternative measure of openness.

### 4.3 Empirical Analysis

The study initially sought to use simple Ordinary Least Squares (OLS) estimations in the regression process to estimate and ascertain the relation between financial development and remittances amidst other factors that are deemed to affect the level of financial development. Prior to these OLS estimations, the basic assumptions of the OLS were tested to ascertain whether the OLS could provide Best Linear Unbiased Estimator (BLUE) necessary enough to meet the objectives of the study. According to the Gauss – Markov theorem, the OLS will be BLUE when there are no difficulties of autocorrelation and heteroskedasticity.

Preceding the decision on the usage of the Ordinary Least Squares (OLS) estimations, various tests are performed testing for the assumptions of OLS for its appropriateness.

First of all, the study performs the normality test using Sharpiro-Wilk normality test. Secondly, the Wooldridge's test for auto correlation in panel data was used to assess the no auto correlation assumption needed to embark on OLS estimation. Again, the Breusch-Pagan/ Cook-Weisberg (C-W) test for heteroskedasticity was used to test for the homoskedasticity assumption of the Ordinary Least Squares.

The results for the univariate normality test (Sharpiro-Wilk normality test) performed are shown in table 4.2. The null hypothesis of the Sharpiro-Wilk normality test is that the data is normally distributed. As shown in the table 4.2, the null hypothesis was rejected under all the variables. Rejecting the null hypothesis basically means that the data is not normally distributed. The results for the Wooldridge's test for auto correlation in panel data and Breusch-Pagan/Cook-Weisberg test for heteroskedasticity are reported in Table 4.4 below. These tests are conducted on the Ordinary Least Squares estimations of the three models.

**Table 4.3 Pre Estimation Diagnostics**

| Diagnostic Tests | CRD | BDP | M2 |
|---|---|---|---|
| Doornik-Hansen | 628000[0.000]. | 608000[0.000] | 633000[0.0000] |
| Hausman's test | 16.91[0.0020] | 1.44[0.9202] | 1.70[0.8892] |
| Breusch-Pagan/C-W test for heteroskedasticity | 185.30[0.0000] | 34.24[0.0000] | 35.12[0.0000] |
| Breusch-Pagans LM test for random effect | 3196.76[0.0000] | 2684.56[0.0000] | 3636.03[0.0000] |
| Woodridge test for serial correlation | 8.280[0.0060] | 130.269[0.0000] | 101.244[0.0000] |

*The p values are in parentheses []: Prob>chi2*

Beginning with the pre estimations diagnostics, the Doornik-*Hansen test* for multivariate normality tests was conducted which has the null hypothesis that the data is normally

distributed. As shown in table 4.3, in all models, the null hypotheses of normality were rejected. This indicates that the assumption of normality was not met in the OLS. Again, the null hypothesis of the Wooldridge's test for serial correlation is that there is no first order auto correlation. In table 4.4, all the models did not meet the assumption of no first order auto correlation since the null hypotheses were rejected. Likely, none of the models met the assumption of homoskedasticity. Looking from the Breusch-Pagans/ C-W test for heteroskedasticity, the table exhibits that in all cases the null hypothesis of constant variance among the error terms was rejected.

The Hausman's test was used to ascertain the appropriateness of the fixed effect or random effect estimations of the model. From the tests above, the use of the fixed effect estimations was apposite for the estimations of the model with credit to private sector to GDP as the dependent variable whereas the other tests deemed random effect estimations as apt with bank deposits and quasi money to GDP as dependent variables. Breusch-Pagans LM test for random effect is also used to know the appropriateness of the random effects over the ordinary least square estimations. From the table, the random effect estimations are preferred over the OLS.

The research assesses the stationary nature of the unbalanced panel data, the research adopts the Augmented Dicker Fuller unit root test as well as the Philips Peron unit root test. As represented in the tables 4.6 (a) and (b), some of the variables are stationary with the raw data, whereas others in Table 4.6 (b) were stationary at $1^{st}$ differencing.

**Tables 4.6 Units root test of Panel Data**

(a) Unit root tests at levels

| Variable | ADF | PP |
|---|---|---|
| CRD | 188.046[0.0000***] | 147.063[0.0001***] |
| BDP | 74.7735[0.9611] | 108.266[0.2247] |
| M2 | 102.197[0.8432] | 79.8639[0.8760] |
| REM | 110.473[0.1519] | 115.876[0.0818*] |
| PCGDP | 24.8632[1.0000] | 16.1173[1.0000] |
| LOGGDP | 12.3640[1.0000] | 17.723[1.0000] |
| INF | 382.192[0.0000***] | 421.447[0.0000***] |
| FDI | 257.796[0.0000***] | 241.607[0.0000***] |
| EXP | 138.533[0.0044***] | 126.6071[0.0275**] |

*p values are in brackets []. The symbol *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.*

(b) Unit root tests at First Differencing

| Variable | ADF | PP |
|---|---|---|
| BDP | 610.372[0.0000***] | 731.285[0.0000***] |
| M2 | 514.287[0.0000***] | 647.593[0.0000***] |
| REM | 469.343[0.0000***] | 708.781[0.0000***] |
| PCGDP | 332.315[0.0000***] | 431.134[0.0000***] |
| LOGGDP | 435.274[0.0000***] | 476.631[0.0000***] |

*p values are in brackets []. The symbol *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.*

This paper first examines the link between financial development and remittances by running estimations with a country and time fixed effects to control for unobserved country characteristics and for common shocks and trends across countries. These estimations should help lessen concerns about endogeneity due to relevant omitted factors. These estimations are firstly performed on all fifty (50) countries included in the sample. This study again assumes that there is a unit effect that exists in this data set. This would mean that the values of the dependent variables differ systematically across states. If this is ignored, the correlation coefficients produced from the regressions will be biased. Thus, to address these issues we include the random effect estimations with systematic variance across units. However, instead of including unit dummies to fix this problem, the unit variance is included in the error term and the appropriate assumptions are subsequently made about the error term (Stock & Watson, 1995).

For the higher significance of the link between remittances and financial development, the research identified countries from the sample which had their remittances as a percentage to GDP above the $50^{th}$ percentile of the whole data. These estimations are performed using both fixed and random effects as well as all the three measures used as proxies of financial development.

**Table 4.4 FIXED AND RANDOM EFFECT ESTIMATIONS - [ALL COUNTRIES]**

Panel Estimations- [ALL RECIPIENT COUNTRIES]

| | Fixed Effects | | | Random Effects | | |
|---|---|---|---|---|---|---|
| Dependent Variables | CRD | (D)BDP | (D)M2 | CRD | (D)BDP | (D)M2 |
| Independent Variables | | | | | | |
| (D) REM | -0.0617* | 0.1131 | 0.0686** | -0.3203* | 0.0989 | 0.1150** |
| | ['-1.95] | [1.07] | [0.08] | [-1.96] | [1.04] | [1.98] |
| (D) LOGGDP | -9.1839 | -11.944*** | -12.6366*** | -16.9781 | -11.8468*** | -3.5986* |
| | [-2.50] | ['-3.57] | [-4.11] | [-1.52] | [-3.63] | [-1.77] |
| (D) PCGDP | 0.0061** | 0.0015** | 0.0012*** | 0.0062 | 0.0015*** | 0.0012*** |
| | [0.69] | [2.05] | [0.12] | [0.24] | [1.98] | [1.98] |
| INF | -0.0694* | -0.0746*** | 0.0765*** | -0.0677* | -0.0662** | -0.0389*** |
| | [-0.13] | [-6.11] | [-7.22] | [-1.75] | [-5.94] | [-6.77] |
| FDI | -0.3341*** | 0.0257 | 0.0195* | -0.3051*** | 0.03504 | 0.0322** |
| | [-3.38] | [0.85] | [0.71] | [-3.12] | [1.33] | [2.40] |
| EXPORTS | -0.0477 | 0.018558 | 0.0625** | -0.0606 | 0.0047 | 0.0019 |
| | [-0.57] | [0.73] | [2.71] | [-0.80] | [0.25] | [0.30] |
| Constant | 35.0054*** | 0.97447 | -0.1071 | 37.6569*** | 1.4235* | 0.8636*** |
| | [13.28] | [1.22] | [-0.15] | [6.45] | [1.84] | [3.59] |
| R-squared | 0.2142 | 0.4618 | 0.4935 | 0.2513 | 0.4704 | 0.5025 |
| Number of Observations | 716 | 691 | 718 | 716 | 691 | 718 |
| Number of Countries | 48 | 48 | 48 | 48 | 48 | 48 |
| F-statistic | 12.01 | 9.89 | 15.09 | | | |
| Prob (F-statistic) | 0.0001 | 0.0000 | 0.0000 | | | |
| Wald chi 2 | | | | 27.56 | 18.13 | 12.77 |
| Prob> chi 2 | | | | 0.0001 | 0.0000 | 0.0000 |

Absolute values of t-statistics are in brackets []. The symbol *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

**Table 4.5 FIXED AND RANDOM EFFECT ESTIMATIONS ON HIGHER RECEIPIENT COUNTRIES**

Panel Estimations- [HIGHER RECIPIENT COUNTRIES]

| | Fixed Effects | | | Random Effects | | |
|---|---|---|---|---|---|---|
| Dependent Variables | CRD | (D)BDP | (D)M2 | CRD | (D)BDP | (D)M2 |
| Independent Variables | | | | | | |
| (D) REM | -0.3017 | 0.1131 | 0.1532** | 0.1015 | 0.1122* | 0.1429* |
| | ['-1.05] | [1.07] | [2.00] | [0.40] | [1.20] | [0.74] |
| (D) LOGGDP | -15.3153 | -11.9440*** | -5.1925* | -11.4134 | -7.7320** | -9.626** |
| | [-4.32] | ['-3.57] | [-1.66] | [-1.10] | [-2.03] | [-2.43] |
| (D) PCGDP | 0.0678*** | 0.0015** | -0.0017* | 0.0039* | 0.0018 | 0.0004 |
| | [17.63] | [2.05] | ['-1.66] | [0.24] | [0.14] | [1.98] |
| INF | -0.0383 | -0.0746*** | -0.0369*** | -0.0426* | -0.0656*** | -0.0787*** |
| | [-1.17] | [-6.11] | [-4.21] | [-1.30] | [-5.34] | [-7.07] |
| FDI | 0.2153 | 0.0257 | 0.0308 | -0.2771** | 0.0051 | 0.0254 |
| | [1.63] | [0.85] | [0.87] | [-2.05] | [0.01] | [0.57] |
| EXPORTS | 0.0636 | 0.01855 | 0.0081 | 0.0311 | -0.0047 | 0.0057 |
| | [1.59] | [0.73] | [0.76] | [0.41] | ['-0.08] | [0.42] |
| Constant | 9.8354*** | 0.97447 | 0.8845 | 30.2127*** | 1.4434** | 1.4571*** |
| | [6.81] | [1.22] | [2.29] | [6.87] | [2.40] | [2.97] |
| R-squared | 0.2947 | 0.3618 | 0.4035 | 0.3513 | 0.5204 | 0.5025 |
| Number of Observations | 444 | 424 | 444 | 444 | 424 | 444 |
| Number of Countries | 24 | 24 | 24 | 48 | 24 | 48 |
| F-statistic | 67.95 | 13.67 | 6.56 | | | |
| Prob (F-statistic) | 0.0001 | 0.0000 | 0.0000 | | | |
| Wald chi 2 | | | | 7.33 | 38.49 | 67.81 |
| Prob> chi 2 | | | | 0.0001 | 0.0000 | 0.0000 |

Absolute values of t-statistics are in brackets []. The symbol *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively

Tables 4 and 5 above indicate fixed effects and random effects estimations from the baseline estimations. The equation estimated is of the form

$FD_{it} = \alpha_i + \beta \mathrm{Re}\, m_{it} + \sum_{j=1}^{5} \beta_{3j} X_{itj} + \varepsilon_{it}$ where FD refers to financial development measured as the percentage of bank credit to GDP , bank deposits and quasi money (M2), all separately, in country i at time t. Remittances to GDP is the share of remittances as a percentage of GDP in country *i* at period t. X is a matrix of controls for each country i at time t including: GDP per capita, measured in constant dollars; Log of GDP, stated in constant dollars; Inflation, defined as the percentage change in the GDP deflator; Exports to GDP, the share of total exports as a percentage of GDP; FDI inflows to GDP, foreign direct investment expressed as percentage of GDP. For these estimations, the variables were either stationary at levels or stationary at 1$^{st}$ differencing.

Tables 4.4 show estimations that include all the countries in the sample. Table 4.5 on the other hand include only those countries for which the data gathered determined that remittances transferred were greater than a threshold of one (1) percent of GDP which were recounted as the 50$^{th}$ percentile highest recipients of remittances for the years under study. The mechanisms of transfers for these remittances, for the purposes of this research are deemed official, either by a banking institution and/or at least some type of non-banking institution (money transfer operators) for which records are available since estimations of the amounts of remittances via the informal channels are significantly inaccurate. These countries are indicated with an asterisk in Appendix. From the tables, the t-statistics are in brackets. *, **, and *** denote significance at the 10, 5, and 1% level, respectively. In table 5 above, limiting the sample to these countries does not change the results, even though the sample of countries and observations had been reduced to

more than half. Remittances continue to be positively and significantly associated with credit to private sector GDP, bank deposit to GDP and quasi money to GDP ratios.

Tables 4.4 and 4.5 above, report the results from both the random and the fixed effects panel regressions. This paper conducts estimations including these estimations including country and time fixed effects as well as random effects which accounts for unobserved country characteristics for common and uncommon shocks and events across the countries under study. These estimations solved the problems that may arise as a result of omitted factors that can explain both the advancement of remittances and of financial development could have led to biases in estimating the impact of remittances on financial development. In all instances, remittances are statistically significant as a positive determinant of financial development. For all the estimations in Africa, the size of the economy seems to be related to financial development. The size of the economy, proxied by the log of GDP is seen with significant correlation coefficients in relation to the financial development of the countries under study.

From the estimations, the size of the country were negatively related to the level of financial sector development measured by the credit to private sector as a percentage of GDP; but was however positively related to the financial development measured with the percentage of bank deposits to GDP and quasi money to GDP. Similarly, per capita GDP seems to significantly affect financial development, though the magnitude of the effect is surprisingly small. Capital and current account openness are both associated with a greater financial development. But then, in some instances there were exhibits of a negative relation of capital and current account openness and financial development.

The link between financial development and remittances can be deemed as positive in all estimations. However, these estimates can be biased by endogeneity between financial development, and remittances. It can be argued that better-developed financial institutions have a positive effect on remittances flowing through the formal channels.

### 4.4 Potential of reverse causality

The results reported on Tables 4.4 and 4.5 ignore the potential reverse causality between remittances and the various measurements of financial development in Africa. There are numerous sources of endogeneity, with suggested biases running in either direction. As posited by other literature, the presence of financial institutions may cause higher remittance flows, either because banking development allows people to finance migration, and hence increases migration flows and remittances, or because the presence of financial institutions is associated with lower costs of sending remittances through increased competition among these institutions, and hence a greater propensity to do so (Giuliano & Ruiz-Arranz, 2006; Gupta et al., 2009; Aggarwal et al., 2010).

In handling the issue of reverse causality, other literature conduct estimations using lagged values (two and higher) of the regressors or the gross domestic product of source country of remittances as instruments in a GMM dynamic framework à la Arellano and Bover (1995). However, according to Gupta et al., (2009) the source country variables as instruments for addressing reverse causality do not perform strongly as instruments for remittances in our sample. This paper uses the panel vector auto regression in handling the issue of reverse causality and also estimates the directions of causality should any exist. The use of the Panel Vector Auto regression is due to the fact that it is able to capture both static and dynamic inter dependencies and treat the links across units in an unrestricted

fashion. Since it is panel data expressed in a time series fashion, it easily incorporates time variations in the coefficients and account for cross sectional dynamic heterogeneities since it has a cross section feature.

Panel VARs are built with the same logic of standard VARs. But, by adding a cross sectional dimension, they are a much more powerful tool to address interesting policy questions related, for example, to the transmission of shocks across borders.

General Model for Panel Vector Auto regression:

$$FD_{it} = \alpha_i + \sum_{j=1}^{k} \beta_{1j} FD_{it-j} + \sum_{j=0}^{k} \beta_{2j} \mathrm{Re}\, m_{it-j} + \sum_{j=1}^{5} \beta_{3j} X_{itj} + \varepsilon_{it} \text{ -----(2)}$$

$$\mathrm{Re}\, m_{it} = \alpha_i + \sum_{j=1}^{k} \lambda_{1j} FD_{it-j} + \sum_{j=0}^{k} \lambda_{2j} \mathrm{Re}\, m_{it-j} + \sum_{j=1}^{5} \lambda_{3j} X_{itj} + \varepsilon_{it} \text{ -----(3)}$$

To estimate the vector auto regression, there is a need to test for the co integration of the variable in order to assess whether there is a long term relationship that exists between the variables of major concern which are remittances and the various measures of financial development.

### 4.5 Cointegration Tests

Cointegration test is performed on the variables of concern, financial development using the three proxies and remittances, to ascertain the existence of a long run relationship. The cointegration test is performed using two different techniques due to the stationarity nature of the variables. From the unit root tests in table 4.6, the credit to private sector as a percentage of GDP as a proxy to financial development is stationary at levels i.e. I (0)

whereas the other proxies bank deposit and money supply all, separately as percentage of GDP, and remittances are stationary at first difference.

We therefore cannot use the Johansen cointegration technique to estimate the long run relationship between CRD and REM. However, the Johansen cointegration test will be deemed appropriate for the other proxies of financial development and remittances since these variables are all stationary at first difference.

To test for the cointegration between CRD and REM, we adopt the use of the Autoregressive Distributive Lag (ARDL) approach proposed by Pesaran and Shin, (1999). The ARDL tests allows cointegration to be tested between variables which are stationary at different levels, that is be they I (0) or I (1). The ARDL test the null hypothesis that the coefficient of the lags of the variables of concern, generated from a least squares estimation, are jointly equal to zero. The alternate hypothesis that at least one of the coefficients is not equal to zero, which prove the existence of a long run relationship. The F-statistic from the estimations are compared to a lower and upper bound table generated from I (0) and I(1) respectively at certain confidence levels. The results are presented in Table 4.7 (a).

Johansen's approach derives two likelihood estimators for the cointegration rank which are the trace test and a maximum eigen value test. The cointegration rank (R) can be formally tested with the trace and the maximum Eigen value statistics. The results are presented in Table 4.7 (b). The trace statistic either rejects the null hypothesis of no co-integration among the variables or does not reject the null hypothesis that there is one co-integration relation between the variables.

**Table 4.7 (a) Wald Test:**

**Cointegration Test with ARDL**

| Test Statistic | Value | df | Probability |
|---|---|---|---|
| F-statistic | 1546.342 | (8, 657) | 0.0000 |
| Chi-square | 12370.73 | 8 | 0.0000 |

Null Hypothesis: C(1)=C(2)=C(3)=C(4)=C(5)=C(6)=C(7)=C(8)=0

**Table 4.7 (b) Johansen Fisher Panel Co integration Tests**

| No. Of CE(s) | | Fishers Statistics | | | | |
|---|---|---|---|---|---|---|
| Series: | | Trace Test | Prob | Maximum Eigen value | Prob | No. of Obs |
| BDP : REM | None | 160.9 | 0.0000 | 142.9 | 0.0000 | 1100 |
| | At most 1 | 112.1 | 0.0028 | 112.1 | 0.0728 | |
| M2 : REM | None | 164.7 | 0 | 150.9 | 0.0000 | 1100 |
| | At most 1 | 112.7 | 0.0025 | 112.7 | 0.0225 | |

Note: $H_0$: No cointegration exists

From the ARDL and Johansen Cointegration tests performed in the tables above, there are cointegrations that exist between the measures of financial development, separately, with the remittances that are received in the African countries. This is interpreted as the existence of a long term relationship between remittances and credit to private sector as a percentage of GDP (CRD). Secondly with bank deposit as a percentage of GDP (BDP) and lastly quasi money to GDP (M2). The null hypothesis of the ARDL and Johansen cointegration tests were that there existed no cointegrations or long run relationship

between the variables of concern, but from tables 4.7(a) and 4.7(b) above the null hypotheses for no cointegrations are rejected.

Enders (2004) states, "cointegrated variables share the same stochastic trends and so cannot drift too far apart." This suggests the existence of a long-run relationship between the series which in our case are remittances and the various proxies of financial development. The trace tests of the various proxies as well as the maximum eigen values as seen from table 4.7 are not wide apart comparing the various proxies.

This research intended to use panel vector auto regression, a method that does not only address the issue of endogeneity but also allows a critical analysis on the issues of causality that may exist between remittances and financial development. It is possible to overcome the limitations in the other studies using a Panel VAR. This is a multi-equation linear model in which each variable of interest is explained by its own lags, as well as the current and past values of the remaining variables which in this case, are remittances and financial development and other controlled variables. This technique is considered useful and reliable despite other natural experiment that can be used to establish causality. This perhaps explains why VARs are usually associated with macro econometrics. However, since there exists a long term relationship which is evidenced from the Johansen co-integration test, we can estimate the relationship coefficient using the Vector Error Correction Model (VECM).

The selection of the number of lags adequate for the estimation of the VECM was done primarily with the use of the Akaike Information Criteria (AIC) and supported with the Schwarz information criterion (SC) and the Hannan-Quinn information criterion (HQIC). The lag selection criteria all mostly specify that the inclusion of four lags would generate

best error coefficients for the model specification which includes the lags of the dependent variable as well as the lags of the endogenous variable while including other variables as control variables. The specification of the lags was done pairing remittances with the various measures of financial development.

The presence of co-integration between variables suggests a long term relationship among the main variables under consideration which are financial sector development (proxied by credit to private sector as a percentage of GDP, bank deposits as a percentage of GDP and quasi money as a percentage of (GDP) and remittances, with the inclusion of other variables that are deemed to influence financial development. Then Vector Error Correction model is deemed suitable for the estimations. The long run relationship between financial sector development and remittances for one co-integrating vector for African countries for the period 1990 to 2011 is displayed below with their respective levels of significance indicated by the asterisks.

**Tables 4.8 Results for vector error correction model for remittances flow and financial development in Africa for the period 1990-2011**

***Table 4.8(a): Credit to private sector as a percentage of GDP (CRD) and Remittances (REM)***

| Variables: | D(CRD) | D(REM) |
|---|---|---|
| ECM(-1) | -0.0482*** | -0.0029 |
| | [-4.5344] | [-0.7196] |
| D(CRD(-1)) | -0.0125 | -0.0002 |
| | [-0.3540] | [-0.0018] |
| D(CRD(-2)) | 0.0871*** | 0.0102 |
| | [ 2.4060] | [ 0.7315] |
| D(CRD(-3)) | 0.0811*** | -0.0009 |
| | [ 2.3932] | [-0.0707] |
| D(CRD(-4)) | -0.0128 | 0.0045 |
| | [-0.3950] | [ 0.3610] |
| D(REM(-1)) | -0.0374 | -0.0553 |
| | [-0.3700] | [-1.4094] |
| D(REM(-2)) | 0.0507* | 0.0868** |
| | [0.5019] | [2.2129] |
| D(REM(-3)) | -0.1155 | -0.0876** |
| | [-1.1458] | [-2.2414] |
| D(REM(-4)) | -0.0711 | 0.1278 |
| | [-0.6994] | [3.2397] |
| DLOGGDP | 6.7497*** | -5.0112 |
| | [ 3.4744] | [-6.6525] |
| DPCGDP | 0.0043*** | 0.0001 |
| | [ 6.5105] | [ 0.3918] |
| INF | -0.1806*** | 0.0005 |
| | [-6.5086] | [ 0.0469] |
| FDI | 0.0918 | 0.0645* |
| | [1.34670] | [ 2.4407] |
| EXP | -0.02397 | -0.0079 |
| | [-1.0978] | [-0.9336] |
| C | 2.0198* | 0.1848 |
| | [ 2.4196] | [ 0.5711] |
| R-squared | 0.3820 | 0.1134 |
| Adj. R-squared | 0.3636 | 0.0934 |
| F-statistic | 9.8879 | 5.6853 |
| Akaike AIC | 7.2879 | 5.3931 |

*Figures in parentheses represent the t statistics.*, ** and *** denote 10%, 5% and 1% significance levels respectively.*

***Table 4.8(b): Bank Deposit as a percentage of GDP (BDP) and Remittances (REM)***

| Variables: | D(BDP) | D(REM) |
|---|---|---|
| ECM(-1) | -0.0003** | 0.0063*** |
| | [-0.1970] | [ 5.1773] |
| D(BDP(-1)) | 0.0220* | 0.0071 |
| | [ 0.6455] | [ 0.2946] |
| D(BDP(-2)) | -0.0271 | 0.0073 |
| | [-0.7929] | [ 0.3013] |
| D(BDP(-3)) | -0.0284 | -0.0160 |
| | [-0.8563] | [-0.6820] |
| D(BDP(-4)) | -0.0698* | 0.0082* |
| | [-2.1185] | [ 0.3517] |
| D(REM(-1)) | 0.0035** | 0.0268 |
| | [ 0.0618] | [ 0.6541] |
| D(REM(-2)) | -0.0163 | -0.0004 |
| | [-0.2833] | [-0.0092] |
| D(REM(-3)) | 0.0876* | -0.0248 |
| | [ 1.5085] | [-0.6031] |
| D(REM(-4)) | 0.0280 | -0.0732* |
| | [ 0.4903] | [-1.8035] |
| DLOGGDP | 2.9074** | -7.1305** |
| | [ 2.3553] | [-8.1326] |
| DPCGDP | 0.0052** | 0.0007 |
| | [ 14.9815] | [ 0.2930] |
| INF | -0.1189** | 0.0113** |
| | [-7.0888] | [ 0.9541] |
| FDI | 0.0728 | 0.1308*** |
| | [ 1.9207] | [ 4.8545] |
| EXP | -0.0102 | -0.0101 |
| | [-0.8287] | [-1.1547] |
| C | 0.9604*** | 0.0174 |
| | [ 2.0957] | [ 0.0535] |
| R-squared | 0.3708 | 0.1995 |
| Adj. R-squared | 0.3550 | 0.1794 |
| F-statistic | 23.4953 | 9.9341 |
| Akaike AIC | 5.9610 | 5.2768 |

*Figures in parentheses represent the t statistics.*, ** and *** denote 10%, 5% and 1% significance levels respectively.*

***Table 4.8(c): Money Supply as a percentage of GDP (M2) and Remittances (REM)***

| Variables: | D(M2) | D(REM) |
|---|---|---|
| ECM(-1) | -0.0337*** | 0.0145*** |
| | [-4.1134] | [2.9947] |
| D(M2(-1)) | -0.0858** | 0.0114 |
| | [-2.5515] | [ 0.5735] |
| D(M2(-2)) | -0.0275 | 0.0155 |
| | [-0.8252] | [ 0.7831] |
| D(M2(-3)) | -0.0469 | 0.0089 |
| | [-1.4092] | [ 0.4533] |
| D(M2(-4)) | -0.0508* | 0.0075 |
| | [-1.4333] | [ 0.3588] |
| D(REM(-1)) | 0.0590 | -0.0371 |
| | [ 0.8906] | [-0.9450] |
| D(REM(-2)) | 0.0249* | -0.0697** |
| | [ 0.3758] | [-1.7806] |
| D(REM(-3)) | 0.1214** | -0.0726* |
| | [ 1.8440] | [-1.8648] |
| D(REM(-4)) | 0.0373 | -0.1129 |
| | [ 0.5628] | [-2.8773] |
| DLOGGDP | 5.6619*** | -4.8123*** |
| | [ 4.6214] | [-6.6394] |
| DPCGDP | 0.0049*** | 0.0006 |
| | [ 11.3663] | [ 0.2607] |
| INF | -0.1397*** | -0.0024 |
| | [-7.7608] | [-0.2203] |
| FDI | 0.1119** | 0.0739** |
| | [ 2.5564] | [ 2.8554] |
| EXP | -0.0002 | -0.0061 |
| | [-0.0173] | [-0.7329] |
| C | 0.8562* | 0.1052 |
| | [ 1.5870] | [ 0.3297] |
| R-squared | 0.3124 | 0.1213 |
| Adj. R-squared | 0.2971 | 0.1018 |
| F-statistic | 20.5712 | 6.2488 |
| Akaike AIC | 6.4159 | 5.3662 |

*Figures in parentheses represent the t statistics.*, ** and *** denote 10%, 5% and 1% significance levels respectively.*

The tables 4.8 above specifies the vector error correction model (VECM) estimated from the equations two (2) and three (3) above. In all, six error correction models are estimated since there are three different measures used as proxies for financial development. The equation specifies firstly, credit to private sector as a percentage of GDP CRD) with remittances. Secondly, the equation uses bank deposits as a percentage of GDP (BDP) and lastly, it uses quasi money/ money supply to GDP (M2) in percentages as proxies for financial sector development in Africa.

The VECM is used in order to assess the existence of causalities that exists between the financial development measured by various proxies and remittances received in Africa via formal means for which records are readily available. From the table testing the cointegration that exists, it is clearly seen that there is only one cointegrating equation per each measure or proxy of financial development required.

In assessing the long run causality that exists from the remittances received and the various proxies of financial sector development, the first error correction equation of each model is used. From the first equation, credit to private sector as a percentage of GDP represented as CRD in the table, is the dependent variable regressed on its lags and the lags of the endogenous variable, remittances (REM) and other exogenous variables known to have an effect on financial development. This is also replicated for the other proxies of financial development in Africa which are bank deposits as a percentage of GDP, represented as BDP and money supply or quasi money as a percentage of GDP, represented as M2. The results from tables 4.8 (a), 4.8 (b) and 4.8 (c) indicate that the coefficients of remittances are

negatively related to financial development in the long run. The p values of the coefficient of the error correction equation are significant across all measures of financial development. This means that remittances have a negative and significant long run relationship with financial development.

The study also assesses the short run causal relationship between remittances and financial development by using the chi square value from the Wald test statistics. We assess this by evaluating the coefficients of the lags of remittances as to whether at least one of the lags is not equal to zero. The short-run causality relationships can be tested through the coefficients of each lags of the explanatory variable which in our case, is either remittances or the proxies of financial development. The null hypothesis is that at least one of the lags of remittances or the proxies of the dependent variable is not equal to zero. This test is presented in the table below:

**Table 4.9(a) Short Run Causality from REM to FD: Wald Test.**

| Dependent Variables | CRD | BDP | M2 |
|---|---|---|---|
| Inde: REM(lags) | | | |
| F-statistic | 0.4228 | 0.6475 | 0.8419 |
| Prob | 0.7922 | 0.6288 | 0.4988 |
| Chi-square | 1.6912 | 2.5899 | 3.3676 |
| Prob> chi 2 | 0.7923 | 0.6286 | 0.4983 |

**Table 4.9(b) Short Run Causality from FD to REM: Wald Test**

| Dependent Variable: | Remittances | | |
|---|---|---|---|
| | CRD(1-4 lags) | BDP(1-4 lags) | M2(1-4 lags) |
| F-statistic | 0.1774 | 0.1604 | 0.2746 |
| Prob | 0.9500 | 0.9583 | 0.8944 |
| chi 2 | 0.7098 | 0.6415 | 1.0983 |
| Prob> chi 2 | 0.9501 | 0.9583 | 0.8945 |

Using all the proxies for financial development the table above, establishes the fact that there is evidence of a short-run causality or relationship from remittances to financial sector development. The p values of the test tend not to reject the null hypothesis which states that at least one of the lags of remittances and financial is not equal to zero and there is the existence of a short run causality of the lags of remittances on financial development. Again, on the other hand, the results from Table 4.9(b) use the Wald test to test for the short run causality that flows from the various proxies of financial development to remittances. The results reported above indicate that at least one of the lags of the proxies of financial sector development does have a causal effect on the levels of remittances received by recipients in African countries in the short-run.

From the above estimations of the Panel Vector Error Correction Model, the research sought to find the viability of the entire model as well as the results. We then perform the auto regressive conditional heteroskedasticity ARCH in other to assess the ARCH effect of the residuals.

**Table 4.10 Test for Autoregressive Conditional Heteroskedasticity**

| Dependent Variables | CRD | BDP | M2 |
|---|---|---|---|
| F-statistic | 0.431475 | 0.003677 | 0.894654 |
| Prob | 0.6498 | 0.9517 | 0.3446 |
| Obs*R-squared | 0.866049 | 0.00369 | 0.896201 |
| Prob> chi 2 | 0.6485 | 0.9516 | 0.3438 |

**Table 4.11 Test for Serial Correlation in Residuals**

| Dependent Variables | CRD | BDP | M2 |
|---|---|---|---|
| F-statistic | 0.879672 | 13.24484 | 23.62508 |
| Prob | 0.4154 | 0.2212 | 0.3124 |
| Obs*R-squared | 1.801321 | 26.07106 | 45.20021 |
| Prob> chi 2 | 0.4063 | 0.2109 | 0.3012 |

The variables in the models are automatically first differenced, using the Vector Error Correction Model. From the error correction model, the coefficient of the error correction model estimates the long run causality that exists between remittances and financial development. The coefficient of the error correction term is the one period lag residual of the cointegrating vector between financial development and remittances. The coefficient of the error from the model is significant.

### 4.6 Discussion of Results

The study sought to find out whether remittances promoted financial development in Africa. This is not the first study of this nature in the context of the impacts of remittances. Other studies have concentrated on the effect of remittances on economic growth, poverty reduction

and financial development. However, this is one of a kind that not only sought to know if remittances promoted financial development, but also to find the causality effect in the long-run and the short-run considering the fact that better financial development could cause higher inflows of remittances to the region under study- Africa.

Based on results from the above estimations (Tables 4.4 and 4.5) it is clear that some of the coefficients of remittances were positively related to some proxies of financial development despite the fact that some of the coefficients were insignificant. Credit to private sector as a percentage of GDP was mostly negatively related to the levels of remittances. From the results of the regression estimations with the proxies used as a measure of financial development in Africa, the second and third proxies or measure of financial development, bank deposits and money supply as percentages of GDP were positive though money supply was mostly significant. The results of the study from the estimations in table 4.5 concentrated on countries which had their remittances above the $50^{th}$ percentile of the whole data on remittances. This included 24 countries in all with Lesotho leading in terms of percentages and Nigeria leading in terms of absolute dollars received.

The results in the first estimations from the fixed and random effects suggest that a higher inflow of remittances is associated with an increase and significant with our indicators of financial sector development in most estimations with the exception of credit to private sector. These results can be rationalized in quite a number of ways which could be in line with other literature (Aggarwal *et al*., 2010). First, remittances are likely to lift individuals' or recipients' financing constraints they may be facing. This might cause the recipients to lower their

demand for bank credit, thus the negative coefficient from the estimations. However, considering the transmission mechanism, recipients of the remittances might receive such funds via their current account or savings account for which might be allowed to be kept at the bank for some period. This will therefore result in positive yet not statistically significant coefficients with the level of credit to the private sector from the estimations. Again, the remittances might be as afore mentioned, deposited in recipients account before a withdrawal for consumption on other survival needs or used to finance government through the purchase of securities. In both cases, there is a positive effect on credit to the private sector as a percentage of GDP.

Again, recipients might receive the remittances as mentioned with their accounts or deposit remittances into banks. In spite of this, if the banks are unwilling to lend money to the private sector and prefer to hold more of liquid assets, then there will be an increase in bank deposit though not significant and thus credit to the private sector will not increase. The use of quasi money as a proxy for financial development was deemed appropriate because it is assertive that not all recipients hold bank accounts and might have as a result, received the funds through other means such as Money Transfer Operators (MTO's) who operate in the bank premises.

The coefficients of the results from the vector error correction model, tries to find out the long-run and short-run relationship that exists between remittances and the proxies of financial development and vice versa. The results indicate that there exits negative relationship between remittances and the various proxies of financial development in the

long-run. These results show that over a longer period, funds sent as remittances do not promote financial development, irrespective of the proxy used for financial development. Remittances received, according to previous literature, are mainly for the survival of recipients. Others indicate that the funds received are for entrepreneurial purposes and for building human capital. All these uses are definitely not going to promote financial development directly as sought by the study.

From tables 4.8 (a), 4.8 (b) and 4.8 (c), the coefficients of the cointegration equation were -0.0482, -0.00034 and -0.03369 for the proxies credit to GDP, bank deposit to GDP and money supply to GDP in percentages respectively. This shows that in the long run, recipients of remittances are likely to bypass credit or loans from financial institutions due to certain financial constraints. The funds received as remittances in the long run neither sits in the accounts of the banks as deposits nor remain in the system freely. Rather they are used for other purposes which in general terms promote economic growth. Again, from the results from the error correction model estimates, there was a long-run causality from the measures of financial development to remittances. This is in line with the reverse causality assumption by previous literature that better financial sectors in countries attracted remittances via the formal channels which are captured in appropriate records.

The results from the VECM estimations showed positive coefficients with some of the lags of remittances with financial development. These estimates also showed significant values at a 5% significant level. This showed that though the remittances did not promote financial sector development in the long-run, yet it had a positive effect of financial development in certain

short-run periods. Again, there was causality flowing from at least one of the lags of remittances to the proxies of financial development in the short-run. There were causalities from the measures of financial development to remittances in the short-run as well. This is very evident from tables 4.9 (a) and 4.9 (b) respectively. Nevertheless there was evidence of causalities from the measures of financial development to remittances in the long run. The coefficient of the cointegration equation with remittances as the dependent variable were positive and significant at 1% level of significance. This can be explained that the more developed the financial sector is in the countries used in the study, the higher the propensity to remit funds due perhaps to the ease with which the transaction can be done or the cost efficiency with which it can be done.

The other variables that were included in the estimations are known from previous literature to promote financial development (Gupta et al., 2009; Aggarwal et al., 2010). The research adopted these measures in assessing whether remittances promoted financial development in Africa. From previous literature, it has been noted that the richer the country, the less amount one had to pay for the cost of receiving remittances. The results from the fixed and random effects estimations showed negative coefficients for the log of GDP with the use of credit to private sector as a percentage of GDP as a measure of financial development, but were positive in the other proxies. This could be as a result of the fact that some countries serve as transit points of remittances to other neighbouring countries. The coefficient of per-capita GDP is positive and significant at 1% and 5% significant levels, consistently with the fact that economic development facilitates financial development. This is in line with previous literature that economic growth with higher institutional and legal quality promoted the

development of the financial sector in most countries, which in the case of this study are some of the countries in Africa. This leads us to conclude that legal and institutional quality are necessary for determining financial sector development.

Following other literature on financial development, the study includes the rate of inflation, a measure of capital account liberalization or financial openness and a country‘s openness to international trade measured by the level of foreign direct investment flows into the region and the level of exports respectively. Inflation is measured by the annual rate of change of the gross domestic product deflator which accounts for macroeconomic instability. Intuitively, inflation discourages financial intermediation and therefore should result in lower financial development (Boyd *et al*., 2001).

The relevant theoretical argument for including this variable is that, in capital-poor countries, the liberalization of international capital flows deepens domestic financial intermediation and provides the necessary conditions for the expansion of the domestic banking sector. Finally, openness to international trade is measured by exports as a percent of GDP. We include it in order to account for possible interactions between trades and domestic financial liberalization (Edwards, 2008).The estimated coefficients of these variables reported in Tables 4.4, 4.5 and 4.8 were statistically significant in some cases with the achievement of their expected signs. It is then said that from the study, few of these macro variables seem to matter much for financial development in our African continent. This suggests that, to some extent, the macro variables mainly capture cross-country variation in financial development rather than variation over time.

Remittances turn out to be negatively associated with financial development in the long-run, and the estimated coefficients of the lags of remittances show both positive and negative effects depending on the lag in question. From the vector error correction model estimations, the negative coefficients could imply that remittances can actually discourage recipients from having bank credits or loans. The issue of a positive relationship between remittances and bank deposits does not hold in the long-run since remittances are perceived to be primarily for survival purposes, build businesses and help with human capital development which in all, help in economic growth and thus do not remain as bank deposits for a longer period. However, the positive relation to and significance of remittances on quasi money as a measure of financial development could be said to be in the right course since these funds are perceived to be circulating within the economy via trade and other transactions. If this is the case, then more remittances do not strongly promote the ability of the banking sector to mobilize domestic resources to enable them allocate credit to the private sector in the long-run.

This research work examined the relationship between remittances and financial development in Africa, using two methods. First, by using fixed and random effects in estimating the baseline link between remittances and financial development, that is the relationship between remittances and financial depth of the recipient countries. Secondly, by using the vector error correction modeling method, the study further sought to explore the relationship that existed between remittances and the three proxies for financial sector development. It could be argued that the effect of remittances in financial development seems to be negative in the long-run but positive in the short-run though not all coefficients were that significant.

# CHAPTER FIVE

# SUMMARY AND CONCLUSION.

## 5.0 Introduction

This chapter presents a summary of the entire study and concludes on the effect of remittances on financial development and vice versa. The study also makes necessary recommendations for policy implementation and further research. Lastly, this chapter presents some limitations of the study.

## 5.1 Summary

Whether or not remittances promote financial development, is an issue that was previously unclear, especially within the African context. The development potential of remittance flows has increasingly been recognized and appreciated in the areas of economic development, poverty reduction and other areas. Regardless of this scenario, the effect of remittances on financial sector development had remained largely unexplored. In more precise and concise terms it could be said of remittances received in Africa as very important on financial development, given the evidence on the growth enhancing and poverty reducing effects of financial development in the region.

This research work attempts to fill the lacuna in literature for Africa as a whole. The study uses balance of payments data on remittance flows to 51 countries in Africa for the twenty year period from 1990 to 2011, to investigate the link between remittances and financial development, focusing on credit to private sector as a percentage of GDP, bank deposits as a

percentage of GDP and money supply to GDP also in percentages in the countries under discussion.

The study first discusses the trend of remittance inflows into the African continent in terms of absolute constant dollars. The study found an increase in the amount of remittances over the period under study with an obvious slight decline in 2007 and 2008 which is evident in the then financial crises in OECD countries from where a major bulk of remittances received emanated. This is not all. The study as well, sought to find out the major recipients of remittances in Africa. From the data gathered, Lesotho was the largest recipient in terms of the percentage of remittances with the GDP, whereas Nigeria topped the chart in terms of constant dollars of remittances received.

The study finds a positive and significant association between remittances and financial sector development using both fixed and random effects as the baseline estimations. Not all the three proxies used as measures of financial development in Africa were significant. Nevertheless, in some instances, the relationships exhibited positive coefficients in all estimations, for which we establish a positive link between remittances and financial development. In estimating these models, certain control variables were included in order to minimize specification biases and produce unbiased results.

One of the main concerns of the study was to resolve the issues of endogeneity caused by omitted variable biases and majorly reverse causality. This was due to the assumption that despite the fact that remittances would promote financial development, better financial sector development could attract higher remittances into the region of the study- Africa. The study

then intended to use the panel vector auto regression (PVAR) in addressing these issues. The study prior to estimation performed a co-integration test to check for the long-run relationship that might be existing between remittances and financial development over the period of the study.

The results of the cointegration test revealed the existence of a long run relationship between the variables of concern. The study then employed the panel vector error correction model (PVECM) which is an extension of VAR which allowed the variables of concern to be regressed on their own lags and lags of other variables using aid to check the short run causalities between remittances and financial development, proxied by on credit to private sector as a percentage of GDP, bank deposits as a percentage of GDP and money supply to GDP also in percentage. The results indicated that remittances tend to have a long run negative effect on financial development. However, remittances had a positive short-run relationship with the various proxies of financial development. It is clearly indicated that some of the lags of remittances caused financial development in the short-run. Also, the reverse causality of financial development causing remittances was positive in the long run and caused remittances in the short-run though it was negative with some lags.

## 5.2 Conclusion

This research work attempted to empirically establish the effect of remittances on financial development in Africa. Though the region receives only a small portion of the total recorded remittances to developing countries compared to the Latin American and the Caribbean and the Asia, the volume of remittances outweighs the flows of other aids to the African region.

The study finds out that remittances have a positive impact on financial development in the short-run but a negative effect in the long run with credit to private sector as a measure of financial development, bank deposit and mostly money supply.

It is clearly noted that migrant remittances or transfers help ease the immediate budget constraints of recipient, and provide an opportunity for small savers to gain a foothold in the formal financial sector. In the long-run however, recipients are able to bypass financial constraints that are imposed on credit acquisition from the financial institutions since recipients can wait to receive funds from migrants. Remittances received can enable recipients who are unbanked acquire certain financial products and services which will in turn improve financial sector development. This is consistent with other literature to an extent, (Gupta et al., 2011; Aggarwal et al., 2010). However, these studies did access the long run relationship between the remittances received and the various proxies of financial development.

The findings generally indicated that remittances positively and significantly influence financial development in Africa. However, these remittances received did not promote financial development in the long-run. This scenario is real since remittances are basically used for survival purposes by the recipients. In line with some previous remittances are purposed for meeting basic needs such as education, clothing, housing etc. by the recipients. These uses of remittances are not promoters of immediate or contemporaneous development of financial development, particularly using credit to private sector and bank deposits, all percentages of GDP and as proxies of financial development. This is due to the fact that remittances received are not long left with financial institutions but for other purposes.

The use of the quasi money as a measure of financial sector development did not prove too much different from the other proxies. This was consistent with all the estimations used though some of the co-efficients are insignificant and negative with the second lag of remittances. The implication of this is that remittances augment flow of money in circulation more than 'loanable' funds in Africa, as remittances are likely used more for consumption and other purposes than being saved in the long-run. The study reveals that financial development caused more remittances for the period under study. Hence, looking at the role of remittances in Africa, as discussed at the outset of the study, the development of the financial sector can help increase the propensity to remit.

The increased adoption of money transfer operations by some financial institutions is an indication that when and if remittances are sent through formal channels certain aspects of the financial sector could improve in the long-run. Financial institutions can adopt money transfer operators and various fund transfer mechanisms in order to introduce unbanked recipients to some financial products and services. This could go a long way to improve the financial sector and promote financial inclusion in most developing countries, particularly in Africa.

### 5.3 Research Limitations

The consistency and adequacy of data from certain countries might pose certain limitations. It is worth remarking that data on remittances exhibit some insufficiencies because they tend to miss great quantity of remittances that are done through informal channels. In addition, the increase in the volume of transfers in a country over time could reflect an improvement on data collection strategy rather than a real increase in remittances flows. Lastly, remittances

recorded for countries might not be the actual receipts recorded since some countries in Africa may act as a conduit of remittances to neighbouring countries. Again, the empirical definitions or proxies of financial development such as stock market capitalization, which could be used to measure the dependent variable might result in variations of results.

### 5.4 Future Research

Further work could be undertaken to refine the analysis as new, and improved data become available with each passing day. Although remittances foster financial development, they are not a universal remedy for all countries in Africa. Further research could be conducted, considering the possible existence of non-linearities in the relationship between financial development and remittances. More generally, at a macro-level, this research work indicates that findings about the impact of remittances may be quite sensitive to the methodological approach and concerns about the endogeneity of remittances remain. In this wise, more research on the link between remittances and financial development is warranted.

# REFERENCES

Acquah, P. A. (2005). The monetary policy setting in Ghana, Issues and Prospects. Modern Ghana.

Adams, R. H., & Page, J. (2005). Do international migration and remittance reduce poverty in developing countries?. *World Development, 33* (10)1645–1669.

Adams, R. H., Cuecuecha, A., & Page, J. (2008). The impact of remittances on poverty and inequality in Ghana. *Policy Research Working Paper Series 4732*, the World Bank.

Adenutsi D. E. (2011). Financial development, international migrant remittances and endogenous growth in Ghana. *Journal of Economics and Finance, 28*(1), 68-89

Aggarwal, R., Demirgüç-Kunt, A., Martínez, P., & Maria S. (2006). Do workers' remittances promote financial development? *Journal of Development Economics,* 255-264

Allen, F., & Giovanneti, G. (2011). The effects of the financial crisis on Sub-Saharan Africa. *Review of Development Finance, 1*(1), PP 1-27

Al-Nasser, O., & Jackson, D., (2012). The impact of financial sector performance in Latin American countries. University of Texas-Pan American.

Arellano, B., Manuel, Bover, Olympia, (1995). Another look at the instrumental variable estimation of error component models. *Journal of Econometrics 68*, 29–51.

Baltagi, B. H. (2005). Econometric Analysis of Panel Data, Wiley, Chichester.

Barajas, A., Chami, R., Fullenkamp, C., & Garg, A. (2010). "The Global Financial Crisis and Workers' Remittances to Africa: What's the Damage? , *International Monetary Fund*.

Beck, T., Levine, R., & Loayza, N. (2000). "Financial Intermediation and Growth: Causality and Causes," *Journal of Monetary Economics, 46*, 31-77.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, Inequality and the Poor. *Journal of Economic Growth, 12* (1), 27-49, http://dx.doi.org/10.1007/s10887-007-9010-6

Beck, T., Levine, R., & Loayza, N. (2000b). Finance and the Sources of Growth. *Journal of Financial Economics, 58*, 261-300.

Calderon, C., & Liu, L. (2003).The direction of causality between financial development and economic growth. *Journal of Development Economics, 72*, 321–334.

Calderon, C., Fajnzylber, Pablo, & Lopez, Humberto. (2007). Remittances and growth: The role of complementary policies. Lessons from Latin America (pp. 33–68). Washington, DC: The World Bank.

Chami, R., Fullenkamp, C., & Jahjah, S. (2003). Are immigrant remittance flows a source of capital for development? IMF Working Paper 03/189. Washington, DC.

Chami, R., Fullenkamp, C., & Gapen, M. (2009). Measuring Workers' Remittances: What should be kept in and what should be left out. Mimeo, International Monetary Fund. *Studies in Economics and Finance*, *28*(1), 68–89.

Demirguc-Kunt, A., Lopez-Cordova, J. E., MartínezPería, M. S., & Woodruff,C. (2011)."Remittances and Banking Sector Breadth and Depth: Evidencefrom Mexico". *Journal of Development Economics*, 95, 229–241.

Faini, R. (2007). Remittances and the brain drain: Do more skilled migrants remit more? *World Bank Economic Review*, *21*(2), 177–191.

Freund, C., & N. Spatafora (2005). "Remittances: Transaction Costs, Determinants, and Informal Flows," World Bank Working Paper No. 3704.

Freund, C. L., & Nikola, S. (2008). Remittances, Transaction Costs, and Informality. *Journal of Development Economics 86*, 356-366.

Geweke, J. (1982). Measurement of linear dependence and feedback between time series. *Journal of the American Statistical Association 79*, 304– 324.

Gibson, McKenzie, & Rohorua, (2005). "How Cost-Elastic are Remittances? Estimates from Tongan Migrants in New Zealand" Mimeo, World Bank.

Giulia, B., & Zazzaro, A. (2011). Remittances and financial development: Substitutes or compliments to economic growth. *Bulletin of Economic Research*

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

Gregorio, J., & Pablo, E. G. (1995). Financial Development and Economic Growth *International Monetary Fund, Washington DC, USA World Development, 23* (3), 433-448.

Gupta, S., Pattillo, C., & Wagh, S. (2009). Effect of remittances on poverty and financial development in Sub-Saharan Africa. *World Development*, *37* (1), 104–115.

Hermes, N., & Lensink, R. (2003). Foreign Direct Investment, Financial Development and Economic Growth. *Journal of Development Studies*, *40*, 142–63.

IMF (2005). Worker's Remittances and Economic Development, in: World Economic Outlook, pp. 69-100, April.

Leon-Ledesma, M., & Piracha, M. (2004). International migration and the role of remittances in Eastern Europe. *International Migration*, *42* (4), 65–84.

Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature*, *35*, 688–726.

Levine, R. (2004). Finance and growth: Theory and evidence. NBER Working Paper 10766. Cambridge, MA.

Levine, R., Loayza, N., & Beck, T. (2000). Financial Intermediation and Growth: Causality and Causes. *Journal of Monetary Economics, 46*, 31-77.

Love, I., & Zicchino, L. (2005). "Financial development and dynamic investment behaviour: Evidence from panel VAR, *World Bank, The Quarterly Review of Economics and Finance* 46 p. 190–210

Motelle, S. (2008). "From bank credit to economic growth in Lesotho: A punctuated process," *Lesotho Social Science Review, 12*(1-2), 55-73.

Mundaca, G. (2005). "Can remittances enhance economic growth? The role of financial markets development,"

Mundaca, G. (2009). Remittances, financial market development, and economic growth: The case of Latin America and the Caribbean. *Review of Development Economics* 13(2), 288–303.

Naudé, W. A. (2010). The determinants of migration from Sub-Saharan African countries, *Journal of African Economies*, *19* (3), 330-356.

Naudé, W. A., & Bezuidenhout , H. (2012). Remittances provide resilience against disasters in Africa. UNU-MERIT Working Paper, No. 2012-026, United Nations University.

Noman, A. M., & Uddin, G. S. (2011). "Remittances and banking sector development in South Asia," *International Journal of Banking and Finance*, *8* (4), 3

Nyamongo, E. M., & Misati, R. N. (2011). Remittances and Banking Sector Development in Sub Saharan African. A Paper presented at the Global Development Forum, Dubai.

Nyamongo, E. M., Misati, R. N., Kipyegon, L., & Ndirangu, L. (2012). Remittances, financial development and economic growth in African. *Journal of Economics and Busines*, *64*, 240-260.

Orozco, M., & Millis, B. (2007). "Remittances, Competition and fair financial access opportunities in Nigeria." Publication for review submitted to United States Agency for International Development.

Pesaran, M., H., & Shin, Y. (1999). An Autoregressive Distributed Lag Modelling Approach to cointegration analysis. Centennial Volume of Ragnar Frisch, eds. Stron, S., Holly, A. and Diamond P. Cambridge University Press. Cambridge.

Pesaran, M. H., Shin Y., & Smith R. (1998). Structural Analysis of Vector Error Correction Models with Exogenous *I* (1) variables. University of Cambridge.

Ratha, D. (2003). Workers' remittances: an important and stable source of external development finance. *Striving for Stability in Development Finance* Ch. 7. World Bank, Washington, DC, pp. 157–175.

Ratha, D. (2004), Understanding the Impact of Remittances, World Bank.

Sander, C., & Maimbo S. (2003). Migrant Labor Remittances in Africa: Reducing Obstacles to Developmental Contributions. *Africa region Working Paper Series* No. 64.

Schumpeter, J. A. (1912). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and Business Cycle,* Harvard University Press, Cambridge, MA.

Social Science Research Council, (2011).*Formal vs. informal remittances.* Retrieved from website: http://www.ssrc.org/publications

Solimano, A. (2003). Workers Remittances to the Andean Region: Mechanisms, Costs and Development Impact, http://www.remesasydesarrollo.org/uploads/media/workers_remittances_andean_region. pdf

Spatafora, N. (2005). Two current issues facing developing countries in World Economic outlook, Washington, DC: International Monetary Fund.

Stock, J. H., & Watson, M. W. (2001). "Vector Auto regressions." *Journal of Economics*

Terry, D., & Williamson, S. (2005). “Beyond small change: Making migrant remittances count,” Inter-American Development Bank, Washington DC

Woodruff, C., & Zenteno, R. (2001). Remittances and micro-enterprises in Mexico, mimeo, University of California San Diego.

Woodruff, C., & Zenteno, R. (2001). Remittances and micro-enterprises in Mexico. UCSD Graduate School of International Relations and Pacific Studies Working Paper. San Diego, CA.

World Bank (2006). Global economic prospects: Economic implications of remittances and migration. Washington, DC: World Bank.

## Appendix

**List of Countries used in study.**

| | |
|---|---|
| Algeria* | Lesotho* |
| Angola | Liberia |
| Benin* | Libya |
| Botswana | Malawi |
| Burkina Faso* | Mali* |
| Burundi | Mauritania |
| Cameroon | Mauritius* |
| Cape Verde | Morocco* |
| Central African Republic | Mozambique* |
| Chad | Namibia |
| Comoros* | Niger* |
| Congo, Dem. Rep. | Nigeria* |
| Congo, Rep. | Rwanda |
| Cote d'Ivoire | Senegal* |
| Djibouti* | Sierra Leone* |
| Egypt, Arab Rep.* | Somalia |
| Equatorial Guinea | South Africa |
| Eritrea | Sudan* |
| Ethiopia | Swaziland* |
| Gabon | Tanzania |
| Gambia, The | Togo* |
| Ghana | Tunisia* |
| Guinea | Uganda |
| Guinea-Bissau* | Zambia* |
| Kenya* | Zimbabwe |