Impact of Migrant Workers' Remittances on East African Economies

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A Thesis submitted to the School of Graduate Studies, Makerere University in partial fulfillment of the requirements for the award of the degree of Master of Science in Agricultural and Applied Economics

September 2010

DECLARATION

I hereby declare that this is original work and has not before been submitted anywhere for the degree award or an equivalent.

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DEDICATION

This Research is dedicated to my late father Henry Wamala Kalule who set my education foundation, my ever – loving mother Mrs. Justine Nalugya Wamala and my fiancée Beatrice for her patience and spirited encouragement while undertaking this study.

ACKNOWLEDGEMENT

I am grateful to my supervisors Drs. Barnabas Kiiza and Jackline Bonabana – Wabbi for their tireless guidance and advice through the entire research and thesis report writing. Special thanks go to Mr. Lubinga Moses for his invaluable assistance during the process of data collection, processing and analysis. I also thank friends especially in the Department of Agricultural Economics and Agribusiness for their encouragement and various pieces of advice while completing this research.

I am equally indebted to African Economic Research Consortium (AERC) based in Nairobi for partly contributing to my M. Sc. training at the shared Facility at the University of Pretoria, South Africa and making partial contribution towards meeting the costs of undertaking this study.

Lastly but not least I thank my fiancée Beatrice Kakayi who was always there while providing material and moral support and encouragement to ensure satisfactory completion of this research

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ABSTRACT

Migrant workers' remittances are a large source of external funding to many poor countries and their receipts to developing countries reached United States Dollars (USD) 240 billion in 2007 (Ratha and Mohapatra, 2007). However, harnessing of remittance receipts for development remains a challenge for East African (EA) economies. Besides, there are also concerns over whether remittances have significant and positive impacts on national output and financial sector growth. Therefore, the study was set up with the purpose of examining whether remittance inflows are driven by investment motives and contribute capital for economic development in the East Africa countries. The study sought to achieve the following objectives: determining the major macroeconomic factors influencing remittance inflows in EA, establishing the impact of remittances on national output and establishing the impact of remittances on financial sector growth.

Panel data was compiled over a period of 21 years (1987 – 2007) for Kenya, 13 years (1995 – 2007) for Tanzania and 10 years (1998 – 2007) for Uganda. Data sources included: World Development Indicators for the remittances, while other variables were obtained from the International Financial Statistics database of International Monetary Fund and the United Nations Statistics Division Common Database for the years. Results indicated that per capita GDP, lagged remittances, domestic real interest rates, and economic activity in developed countries were the major determinants of remittance inflows in East Africa. Remittances were also found to positively and significantly affect both output and financial sector growth. It was then concluded that investment motives rather than mere altruism dominate migrants' decisions to send remittances and these financial inflows could be a source of capital for economic development in East Africa. It was recommended that governments in East African region formulate policies that increase remittance inflows and streamline their formal remittance transfers.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Migrant workers' remittances are a large source of external funding to many poor countries and their receipts to developing countries reached United States Dollars (USD) 240 billion in 2007 (Ratha and Mohapatra, 2007). The remittance amount in that year represented a growth rate of 8.6% per annum of the officially recorded figures. The volume of these financial flows is also said to be twice as much the amount of Official Development Assistance (ODA) to the same countries (Rocher and Pelletier, 2008). However, the true size of remittances is believed to be doubling the recorded figures worldwide. Overall, remittance inflows to developing countries have consistently been increasing, a development attributed to a rise in the number of migrants. It is also reported that the growing integration of migrants in the economies of developed (host) countries has improved these workers' incomes and thus their remittance capacity (Rocher and Pelletier, 2008).

According to Karagöz (2009), remittances have a potential of serving as a development tool and positively impact on economies of recipient countries. At macro – economic level, development effects of remittances can be decomposed into their impact on savings, investments, growth, consumption, poverty and income distribution. At household level, they reduce inequalities in incomes and opportunities, help in acquiring houses, promote entrepreneurial activities, and meet educational and health costs (Karagöz, 2009). However, remittances, like foreign aid, may only be more effective in a good policy environment. For instance, a good investment climate with well-developed financial systems and sound institutions is likely to imply that a higher share of remittances is invested in physical and human capital (Giuliano and Ruiz-Arranz, 2005).

Furthermore, it has been shown that in the economies where the financial system is underdeveloped, remittances alleviate credit constraints and work as a substitute for financial development, improving the allocation of capital and consequently accelerating economic growth (Giuliano and Ruiz-Arranz, 2005).

Despite their potential positive impacts on small economies, other scholars have argued that remittances may not necessarily contribute to economic development. Large inflows of these private transfers are said to lead to unnecessary appreciation of the local currency which translates into expensive domestically produced goods and thus reducing the competitiveness of exports, a condition referred to as 'Dutch disease' problem (Ratha, 2003; Solimano, 2003). Still, remittances are reportedly, spent mostly on consumption, housing, and land, and are likely not used for productive investment that would contribute to long – run growth (Giuliano and Ruiz-Arranz, 2005). Never the less, Ratha (2003) suggests that remittance inflows that raise the consumption levels of rural households might have substantial multiplier effects because they are more likely to be spent on domestically produced goods.

1.2 Migration and Remittance Flows in East Africa

East African (EA) economies including Uganda, Kenya and Tanzania have had a significant number of their citizens migrate in search of employment. According to migration and remittances fact book of the World Bank (2007), the stock of emigrants in 2005 stood at 154,747 in Uganda, 188,789 in Tanzania and 344,857 in Kenya. The share of tertiary educated of the total emigrants in each of the three countries by 2000 stood at 21.6 %, 15.8% and 26.3% in Uganda, Tanzania and Kenya respectively. This trend of affairs could be generating negative effects on these economies through skill shortages that may adversely affect the implementation of development plans.

The leading migrant host (developed) countries are: the United States, United Kingdoms, Sweden, Australia, Canada, Netherlands and Germany. All these countries have higher degrees of economic activity compared to the EA countries. This implies that the economic conditions in developed countries could be generating better employment opportunities and attracting migrants (Shahbaz and Aamir, 2009).

Migrant workers send part of their incomes to their respective countries of origin for either altruism or investment motives (El Mouhoud *et al*., 2008; Aydas *et al*., 2004). The migration and remittance fact book of the World Bank (2007) indicates that the remittance inflows have been increasing since 2000 in Kenya and Uganda. For Tanzania, the magnitudes of remittance inflows are conspicuously small and have been inconsistent between 2000 and 2007 as shown in Table 1.1. Again, remittance figures in 2006 for Kenya and Uganda showed that the inflows exceeded the outflows while in Tanzania, the situation was the reverse. These remittance inflows have also contributed economically and significantly to national output. In 2006, remittances accounted for a share of GDP of 8.7%, 0.1% and 5.3% in Uganda, Tanzania and Kenya respectively (World Bank, 2007).

Workers' remittances, normally in foreign currencies, are channeled through either formal financial institutions like post offices, banks, foreign exchange bureaus and money transfer agencies (Western Union, MoneyGram), or other informal means convenient to the migrants and their families. Hence, remittances reportedly enhance domestic economies' foreign exchange reserves in the national accounts of balance of payment (Chami *et al.*, 2008).

Table 1.1 Official Remittance Inflows and Outflows in East African Countries From 2000 to 2006

Country	Remittances Type	2000	2001	2002	2003	2004	2005	2006	2007e
					(US$ million)				
Uganda	Remittance inflows	238	342	421	306	371	423	814	856
	Remittance outflows	353	355	401	259	235	359	322	-
Tanzania	Remittance inflows	8	15	12	9	11	18	14	14
	Remittance outflows	20	31	27	27	34	31	29	-
Kenya	Remittance inflows	538	550	433	538	620	805	1,128	1,300
	Remittance outflows	34	5	6	7	34	56	25	-

Source: Migration and Remittances Fact book, World Bank (2007)

The nature of remittances and their impact potential on economic and financial sector growth have generated a lot of interest and debates from both policy makers and researchers (Rocher and Pelletier, 2008). Particularly, there are mainly two issues of interest as regards remittance flows and these are: how to manage their macro – economic effects and then how to harness their developmental potential (Chami *et al.*, 2008). Unfortunately, macro – economic factors influencing remittance inflows have not been adequately studied in the East African region. Secondly, little research attention has been paid to examining the impacts of remittance inflows on domestic output and financial sector growth. There is no such known cross – country empirical analysis on remittances covering the three countries of East African region. This study therefore, set out to empirically examine and contribute to the filling of the knowledge void on factors determining remittances inflows in EA, and their impact on economic growth and financial sector deepening.

1.3 Problem Statement

Harnessing of remittance receipts for development remains a challenge for East African economies. This arises partly because of the limited empirical studies on remittances in the region. Besides, the factors determining remittance inflows are not well – known. Existing studies carried out in other countries have yielded inconclusive findings on the determinants of these financial inflows (Buch and Kackulenz, 2004). There is need therefore to determine the major factors influencing remittance inflows in EA and inform the policy formulation process on how to harness such receipts for development.

There are also concerns over whether remittances have significant and positive impacts on national output and financial sector growth. Proponents of remittances as external source of capital for development have argued that when remittances are invested, they contribute to output growth while when consumed they generate positive multipliers effects (Fayissa, 2008). However, the opponents hold the view that they may encourage remittance – recipient households to work less and are likely to be used for consumption smoothing, debt repayment and financing future migration but not investment (Karagöz, 2009). Unfortunately, the available empirical evidence on relationship between workers' remittances and the long – term growth in recipient countries is still mixed (Rocher and Pelletier, 2008). Some studies such as Karagöz (2009), Chami *et al*. (2005) and Chami *et al*. (2003) have found remittances to be negatively impacting on economic growth.

The negative impacts would suggest that the motive behind most remittances is to compensate for income loss following deterioration in the economic environment in migrant home countries (Rocher and Pelletier, 2008). On the other hand, Fayissa (2008) and Giuliano and Ruiz – Arranz (2003) reported positive impacts when the inflows were tested on growth and consequently these studies concluded that remittances are used for investment purposes.

These mixed empirical findings could be arising due to differences in the regions and the inherent traditional sources of economic growth in specific countries. Therefore, this study went ahead to determine the impact of these remittances on national output in terms of domestic real GDP and real per capital GDP in East Africa.

In addition, the role of remittances in financial development is not clear. There is little research attention that has been paid to addressing the question of whether remittances promote financial sector development of recipient countries (Shahbaz *et al*., 2007). Although remittances may have a positive impact on credit market development if banks become more willing to extend credit to remittance recipients, they might lead to a lower demand for credit and cause a dampening effect on credit market development. They may also not increase bank deposits if they are immediately consumed or if remittance recipients distrust financial institutions and prefer other ways to save these funds (Aggarwal *et al.,* 2006). In the EA countries, the impact of these financial transfers on financial sector deepening has not been studied extensively. Thus, this study sought to empirically examine the remittance impact on financial sector growth in terms of money supply (M3) and credit to private sector.

1.4 Objectives of the study

The purpose of the study was to examine whether remittance inflows are influenced by investment motives and contribute capital for economic development in the East African countries. Specifically, the study intended to achieve the following objectives:

(i) To determine the major macroeconomic factors influencing remittance inflows in East Africa

(ii) To establish the impact of remittances on real Gross Domestic Product (GDP)

(iii) To establish the impact of remittances on financial sector growth

1.5 Hypotheses

(a) Domestic per capita GDP, domestic real interest rates and economic activity in migrant host countries positively and significantly influence workers' remittance inflows in East Africa

(b) Remittances positively and significantly affect real GDP of home countries

(c) Remittances positively and significantly influence money supply (M3) and credit to private sector

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Migrant Workers' Remittances

2.1.1 Meaning and Motivation to remit

Migrant workers' remittances can be defined as person – to – person financial flows, well – targeted to the needs of recipients who are often poor. These flows do not typically suffer from governance problems that are normally associated with official aid flows (Ratha and Mohapatra, 2007). Remittances can also be referred to as transfers of funds by workers (remitters) who are living and working in developed (host) countries to their families in home (migrant sending) countries (Karagöz, 2009).

According to the Organization of Economic Cooperation and Development, OECD (2006), the International Monetary Fund (IMF) interprets and records remittances in three different sections of the balance of payments which include: compensation of employees, workers' remittances and migrants' transfers. Compensations of employees are the gross earnings of workers residing abroad for less than 12 months, including the value of in-kind benefits (recorded in the current account). Workers' remittances are the value of monetary transfers sent home from workers residing abroad for more than one year (also recorded in the current account). Migrants' transfers represent the net wealth of migrants who move from one country of employment to another (recorded in the capital account).

While the IMF categories are well defined, several problems have been identified to be associated with their implementation worldwide which can affect their comparability (Jongwanich, 2007).

In order to capture the extent of migrant remittances in a better way, scholars use different calculation methods. Some calculate them as the sum of all the three components identified above i.e. compensation of employees, workers' remittances, and migrants' transfers (Ratha, 2003). Others sum up just compensation of employees and workers' remittances (Taylor, 1999). Daianu (2001) proposes a totally different method of computation of remittance credits that involves summing up compensation of employees, workers' remittances, and "other current transfers of other sectors". Daianu's method of estimating international migrants' remittances flows is considered to be the most appropriate to overcome the discrepancies referred to above (OECD, 2006).

In addition, remittance figures are still faced with the challenge of underestimation/ under recording. Puri and Ritzema (1999) observed that officially transferred remittances published in the recipient countries' balance of payments grossly underestimate the actual level of remittances. The degree of under recording/ leakage varies from country to country. There are two types of leakages: one due to erroneous (imprecise accounting) and the other due to the choice of informal, unsupervised channels for remittances.

Erroneous practices happen due to the tendency of treating informal remittances as foreign exchange leakages from the labour exporting country. The leakages of this form are categorized as follows: (1) "personal imports" of migrant workers (i.e. goods imported by returning migrants under the duty free allowance facility or brought along with them under personal baggage/ gift facilities) and (2) the savings brought home on return (in the form of cash or traveler's cheques) that are latter converted into local currency at domestic banks (Athukorala, 1993). The informal means include: retention of remittance savings in personal accounts of migrants, hand carrying and use informal foreign exchange intermediaries (Puri and Ritzema, 1999).

Several reasons have been advanced to explain the occurrence of Leakages of remittances which mostly relate to convenience of migrant and family. Puri and Ritzema (1999) summarize these reasons as follows: firstly, where banking and foreign exchange facilities are inadequate, inefficient, or even destroyed, informal non-bank means of transfer may be used, regardless of transactions costs.

Secondly, significant price differences between the remittance sending and receiving countries may encourage sending or carrying remittances in the form of goods (remittances in kind) either for personal use by the recipient or for resale in the informal market. Thirdly, informal foreign exchange markets may be used when the remittance – receiving country's exchange rate is overvalued which acts as an implicit tax on those who remit money through official channels. This closely relates to the highly restrictive trade and exchange control systems in place which generate a demand for capital flight through under-invoicing of imports and smuggling. Fourthly, financial repression, characterized notably by negative real interest rates on domestic savings, also drive money balances to foreign bank accounts.

Various theories have been advanced to explain why migrant workers remit part of their incomes to homes countries. Chimhowu *et al* (2003) notes that there are three schools of thoughts on motivation to remit and these are: risk sharing, altruism motives, and risk sharing with altruism. Risk – sharing school of thought explains that a migrant sends funds in order to secure own and family livelihoods in the event of external shock. Altruism school explains one's obligation to the household that is remitting out of affection and responsibility. Lastly, the risk – sharing with altruism adds the self – interest to the livelihoods.

2.1.2 Remittance Data and Measurement

Examination of the role of remittances in economies still faces a challenge of the quality and coverage of data in several countries (Jongwanich, 2007). These data limitations are attributed to informal means of channeling remittances to migrant sending countries and improper procedure of capturing remittance statistics. For instance, a number of data entries have classified export revenues, non – resident deposits, tourism receipts or even Foreign Direct Investment (FDI) as under remittances. On the other hand, some data in many countries is not recorded due to weaknesses in data collection, and ignoring small remittance transactions through formal channels such as post office, exchange bureaus and other agents of Money Transfer Operations (MTO) in official statistics (Jongwanich, 2007).

Conspicuously, there is no universal agreement on how to measure international workers' remittances to developing countries (Karagöz, 2009). Puri and Ritzema (1999) stress that data collection, reporting practices and procedure among labour – exporting and labour – receiving countries need to be streamlined. Consequently, the measurement uncertainty along with unknown extent of unrecorded remittances estimated to exceed 50% have necessitated the empirical analysis to merely emphasis 'official cash remittances' (El Mouhoud *et al*., 2008; Karagöz, 2009, Aydas *et al*., 2004). This study therefore used official cash remittances to measure total remittance inflows in E.A. countries of Kenya, Tanzania and Uganda.

Rocher and Pelletier (2008) note that efforts to standardize the methodology, collection and recording of reliable data in terms of money transfers remain particularly sensitive. One of the main sources of difficulties is the myriad of financial and non-financial institutions likely to capture all or some of the remittance flows, which involves, for central banks establishing the balance of payments and preparation of specific reports.

A study by De Luna Martinez (2005) in 40 developing countries revealed that, only 65% of central banks collected data on the activities of bureaux de change, and just 35% and 38% on the activities of money transfer companies and post offices. However, the activity of commercial banks was better documented, with 90% coverage.

Another major constraint is in the estimation of the share of payment flows sent via informal channels. These flows comprise all money transfers that do not involve formal contracts, such as money transferred in cash or via other means (e.g. fax) between friends, family members or community members. World Bank (2006) study indicated that in this domain, only a quarter of central banks in the sample collected data on informal transfers, via the use of special inquiries, either by questioning migrants, upon return to their country, or recipient households.

In view of the risk of errors and approximations inherent in these methods of evaluation and the absence of monitoring of these flows by a large number of central banks, the balance of payments data therefore does not reflect the exact amount of the money transfers. Consequently, informal transfers to Latin America are estimated at 5 to 20% of official payments. The proportion is even higher for flows to Sub – Saharan Africa (SSA), where informal transfers represent 45 to 65% of formal flows (Freund and Spatafora, 2005).

However, Jongwanich (2007) observes that the quality and coverage of data on remittances are still limited by difficulty in classifications in several countries such as Malaysia and China. In some countries, remittances are often misclassified as export revenue, tourism receipts, non-resident deposits, or even foreign direct investment (FDI). Secondly, a substantial portion of formal remittance inflows go unrecorded, due to weakness in data collection.

Reporting of small remittance transactions made through formal channels is not mandatory in most countries and remittances sent through post offices, exchange bureaus, and other agents of money transfer operators (MTOs) are often not reflected in official statistics. Thirdly, inflows through informal channels such as unregulated money transfer firms or family who carry remittances are rarely computed.

2.2 Determinants of Workers' Remittance Inflows

The level of migrants' remittance flows depends on both the migrants' ability, *i.e.* their income and the savings from income, and their motivation to remit savings back to the home country (OECD, 2006). The willingness to remit is also determined by the duration of migration, the family situation of migrants which is dependent on marital status and possession of children and network effects based on attachment of the people moved with or left behind (Munshi, 2003).

Puri and Ritzema (1999) identifies two groups of factors that influence the level and timing of remittance inflows in domestic economies and these are distinguished as micro – factors and macro – factors. Whereas, the micro – economic factors are mostly socio – demographic factors related to migrant and his/ her family, the macro – economic ones combine both institutional and political factors affecting the economy in general. Generally, both micro and macro factors affect the country's pool of remittance income, the decision whether or not to send remittances, the amount to remit and the uses of remittance incomes.

Furthermore, Schrooten (2005) categorizes the factors determining remittance inflows into two i.e. objective and subjective factors. Objective factors are related to macroeconomic conditions in the home country and these include: the average income level and the unemployment rate that seem to directly and indirectly effect the situation of the household of origin.

In addition, remittances are often considered an instrument to overcome constraints and market failures in the domestic financial sector. The subjective factors are: duration of the stay of migrant in host country, the level of migrant skills, the earnings of the migrant as well as the economic situation of the family of origin might play a crucial role.

2.2.2 Micro – economic Determinants

Micro – economic determinants operate mostly at household level. These factors are: the ratio of female in population of host country, years since worker migrated, household income level, employment of other household members and marital status of migrant. Other micro economic factors include: years of education of migrant and occupation status of migrants (Aydas *et al*., 2004). In addition, Ilahi and Jafery (1999) add two to the list of variables as: number of children and their education position, and the pre – migration economic situation. These socio – demographic determinants are argued to have a close relationship with migrant motives to remit (Aydas *et al*., 2004).

Several microeconomic studies have indicated that the income level of the migrant and his family are the main determinants of remittance inflows (Buch and Kuckulenz, 2004). For example, Durand *et al.* (1996) showed that the most important determinants shaping the amount remitted included: the migrant's wage and job situation, the number of dependents at home, marital status, and age of the migrant. Latter, Brière *et al.* (2002) used Dominican data to examine the two main motives to remit, i.e. the intention to insure relatives at home against changes in income and the intention to invest in the home country. The authors found the main factors determining the magnitude of remittances as the migrants' destination, gender, and household composition. The study concluded that the motive of migrants to remit crucially depended on whether migration is temporary or permanent.

Glytsos (1997) while examining the differences in remittance decisions between temporary migrants and permanent migrants found that remittances were often obligatory for temporary migrants, while remittances sent by permanent migrants were mostly gifts to relatives in the home country.

Generally, empirical research on determinants of remittance inflows has mainly focused on micro economic level using survey data (Shahbaz and Aamir, 2009; Aydas *et al*., 2004; and Buch and Kuckulenz, 2004). Micro economic case studies have however been criticized for undervaluing the macro economic impact of remittances by focusing on isolated community (Buch and Kuckulenz, 2004). Therefore, the current study deviated from the micro economic position by concentrating on macro economic factors affecting remittance inflows.

2.2.3 Macro – economic Determinants

Macro – economic determinants are those that are economic, political and institutional in nature. Several studies have considered various macro economic variables while empirically examining factors affecting remittance inflows. The variables include: unemployment rate, stock of emigrant workers, external wage rates, domestic per capita income, inflation rate, foreign exchange rates, domestic interest rates or interest rate differential, and differences in economic situations in migrant sending and recipient countries (El Mouhoud *et al*., 2008; Aydas *et al*., 2004; Buch and Kuckulenz, 2004). Furthermore, Sakka (2005) added to the list of macro economic variables as: monetary policy proxied by money supply growth over trend GDP and fiscal policy discipline proxied by budget deficit. Previous studies such as Aydas *et al.* (2004) have suggested that host country income is a significant determinant of workers' remittances due to both increased quantity demanded of the migrant labor and increase in the wages offered to the workers.

If available wage rates and the economic situation in host country are comparably better, they attract a larger number of emigrants and increase the remittance capacity to home country and thus a positive sign would be expected (Shahbaz and Aamir, 2009). Related findings are also reported by Huang and Silva (2005) in Mexico; Gupta (2005) in India, and Elbadawi and Rocha (1992) for North Africa and South Europe. The stock of workers abroad is also equally argued to positively affect the remittance receipts. Aydas *et al.* (2005) found insignificant impact of emigrants stock on remittances in Turkey while a study by Elbadawi and Rocha (1992) in North Africa and South Europe found positive and significant impact of the same variable. The income level of the migrants' country of origin and inflation have yielded findings leading to the conclusions on motivation to remit either as consumption smoothing (altruistic) or investment motives.

Growth of the economy in terms of annual change in per capita GDP or real GDP, and inflation in the economy of origin may affect the remittances in both ways. If investment is the main motive to remit, the effect on remittance inflows by the former variable would be positive and the latter would give a negative relationship. However, if the concern for the relatives in the country of origin dominates migrants' decisions to remit, opposite results in either case could be obtained (El Mouhoud *et al.*, 2008; Aydas *et al.*, 2004). The effect of high interest rate differential is also ambiguous due to two possible reasons: while high domestic interest rates may provide incentives for sending remittances, it may also reflect economic instability and high risk and thus negatively affecting the inflow of these private transfers (Aydas *et al.*, 2004).

Others studies incorporate other variables such as trade openness or the Terms of Trade (TOT) and is computed as the sum of exports and imports over GDP. Trade openness of a given economy is an indicator of international integration of the real sector.

A higher degree of this indicator makes the export of labor forces - which is a precondition for remittances - less attractive. Therefore, a negative sign of this variable is expected (Schrooten, 2005).

In all, the available empirical evidence on the relationship between remittances and macro economic variables is still inconclusive (Shahbaz and Aamir, 2009). The only research work that has led to conclusions that investment motives drive migrants' decisions to send remittances, have studied the macro – economic determinants of remittances in small economies. All these found positive impacts by per capita GDP and interest rate differential while negative impacts are yielded by domestic inflation rate. Aydas *et al.* (2004) evaluated macro economic impacts using a data range spreading from 1979 to 1993 and found black market premium, inflation rate and military regimes in Turkey negatively and significantly affected remittance inflows while economic growth positively affected remittances.

On the contrary, negative impacts by the same variables have been reported in studies that end up with altruistic conclusions. To begin with, El Mouhoud *et al.* (2008) analyzed bilateral data between Southern and Eastern Mediterranean countries (SEMC) and 11 topmost migrant hosting countries. The findings of the study led to the conclusion that altruistic motives dominated remittance inflows into SEMC. Shahbaz and Aamir (2009) used time series data for a period of 1971 to 2006 to model altruism and the influence of other factors that affect remittances inflows. The findings of that study were that real world interest rate and depreciation of the foreign exchange had an inverse but insignificant impact on the level of remittances. Schrooten (2005) modeled a dynamic panel data set for 24 former socialist countries for a period of 1990 to 2003 and found the determinants of remittances per capita and remittances as share of GDP were similar.

This study particularly observed that a rise in per capita GDP by 1% would lead to a decrease in remittance inflows by 0.8%.

The current study further investigated the influence of the macro economic variables in determining the level of remittance inflows to Eastern African economies that are typically classified as Least Developed Countries (LDCs).

El Mouhoud *et al.* (2008) argue that host country effects are much more significant than the home country effects. The authors support their argument with the work of Huang and Silva (2005) who tried to determine whether the host and/or home country macroeconomic conditions are the ones affecting remittances. The latter authors using a Vector Error Correction Model (VECM) found host country economic conditions to be the most important factor driving remittances. VECM was used because they argued that these models solve the endogeneity problem between remittances and other macroeconomic variables. Such a finding has many important policy implications for the migrant exporting countries for which remittances are the main foreign exchange funding. This would imply national governments would influence little the magnitude of remittances using domestic policies.

In summary, it has been argued that the theoretical literature on the macroeconomic determinants of remittances is much less rich (Schrooten, 2005). This study therefore considered to further examine the major macro economic factors influencing remittance inflows since the factors underlying these inflows can also be manipulated to enhance the economic development.

2.3 Impact of Remittances on the Economy

2.3.1 Impact on the Output of the Economy

Remittances have become a popular issue in the international financial literature because of their volume and their potential to reduce poverty. They are relatively stable and are an attractive source of foreign earnings for developing countries.

Workers' remittances are said to positively affect growth through a number of channels (Ratha, 2003). The positive effect may be realized through entrepreneurial activity (physical investment), financing education and health or improving a country's creditworthiness and thereby enhance its access to international capital markets (Jongwanich, 2007).

Schrooten (2005) identifies three types of theoretical models used in literature to study macro – economic effects of remittances. These theoretical strands are: those arguing that remittances have a positive impact on the domestic economic development, those explaining negative effects on the economy and then the other combining the above two competing arguments. Within the framework of positive effects of remittances, they are said to provide a fund for higher savings and foreign exchange and are often considered as to perform similar functions as other international flows and thus to broaden the base for economic development (Connell and Conwey 2000).

A second strand of literature focuses on the adverse effects of remittances and explains that a high dependency on remittances might decrease the incentives for a sufficient domestic economic policy. It is argued that worker – sending countries might get accustomed to these additional funding (Martin 1990). This is believed to negatively affect the incentives system that would create an efficient domestic institutional framework. Furthermore, there might be a tendency of substituting a good economic policy by higher future migration in the economy (Schrooten, 2005). A third strand of literature tries to bring together the merits and demerits of the two competing strands. This arises because remittances influence investment and growth in many ways, directly and indirectly. Consequently, the studies in support of the third strand of models clearly show that the impact of remittances on the domestic economy is highly dependent on the domestic policy (Glytsos, 1997; McCormick and Wahba, 2000).

While building on the strands explained above, Fayissa (2008) points out that the macroeconomic impacts of remittances have been disregarded mainly due to the assumption that they generate negative effects in the economy. The author explained that the theoretical strand suggested that workers' remittances are mainly used for consumption purposes meaning they are compensatory transfers between family members who lost skilled workers due to migration and, hence, have minimal impact on investment.

On the contrary however, Stahl and Arnold (1986), and latter Chami *et al* (2005) have argued that the use of remittances for consumption may have a positive effect on growth because of their possible multiplier effect. This assertion is supported by results that have shown that remittances positively impact on the conventional sources of growth such as investment in physical and human capital and the ability of households to spend on health, housing, nutrition, and other household items and enhance their productivity (Fayissa, 2008). In addition, Kihangire and Katarikawe (2008) observed that though remittances are primarily intended to meet the basic needs of family members back home, they could also generate opportunities for local communities and national economies

Empirically, the impact of remittances on growth in cross country studies has yielded mixed findings (Karagöz, 2009; Gupta *et al*., 2007). This has been partly attributed to the decentralized decision-making process that characterizes the use of remittances which makes it difficult to gauge their aggregate effects. Studies that focus on the labor supply response of recipient households have found that remittances lower growth (Azam and Gubert, 2005; Chami *et al.* 2003). On the other hand, studies that link remittances to investment, where remittances either substitute for or improve financial access, tend to conclude that remittances stimulate growth (Toxopeus and Lensink, 2006; Giuliano and Ruiz-Arranz, 2005).

According to Chami *et al*. (2005), modeling remittance receipts can be based on either investment, altruism, or exchange based motivations. Altruistic motives school of thought argues that remittances are compensatory in nature. If present in the model, moral hazards could also be present which affects the recipient relatives' effort to work and consequently resulting into negative effects of remittances on output.

However, when remittances are observed as investment inflows, the effect on output would be opposite, and expected to increase output growth (Chami *et al*., 2008). In such a case, the recipient is modeled as expending effort on investment projects that have uncertain income. Lastly, exchange based motivation requires that the recipient expend effort on looking after the interests of the immigrant as well as the recipient's own interests (Chami *et al*., 2005). This motivation also results into positive impact on output. The current study opted for the investment motivation and it is argued that remittances could be a source of capital for economic development in Eastern African countries.

According to Jongwanich (2007), there is little agreement and scant information in the literature concerning the impact of international migration and remittances on economic growth. Firstly, remittances may reduce credit constraint of household receipts so that entrepreneurial activity and private investment could increase (Yang, 2004; Woodruff and Zenteno, 2004). Households in developing countries confront much less efficient credit and financial markets so that access to credit markets seems to be their biggest concerns and thus remittance inflows could help households to set up their entrepreneurial activity (Karagöz, 2009; Giuliano and Ruiz-Arranz, 2005).

Over and above physical investment, remittances could also help to finance education and health, which are also key variables in promoting (long-term) economic growth.

Secondly, World Bank (2006) points out that the calculation of country credit ratings by major international also depends on its magnitude of remittance flows. The higher the magnitude of remittance flows the better the credit rating rank the country could reach. This is another way to increase both physical and human capital investment, thereby enhancing economic growth. Thirdly, remittance inflows could generate positive effects to economic growth through multiplier-effect mechanisms (Ratha, 2003). While there are backward and forward linkages in investment activities, an increase in investment of one household could generate an increase in income to other household (Karagöz, 2009). In the context of increasing returns, the expansion of one sector could increase the optimal size of other sectors.

Loser *et al*. (2006) notes that remittances respond to investment opportunities in the home country as much as to charitable or insurance motives. Many migrants may also invest their savings in small businesses, real estate or other assets in their own country they realize that the local markets better than those in their host countries, or probably expecting to return in the future (Schiopu and Siegfried, 2006; Chimhowu *et al.*, 2003). In about two-thirds of developing countries, remittances are mostly profit-driven and increase when economic conditions improve back home (Loser *et al*., 2006). Such external monetary flows are particularly used for investment where the financial sector does not meet the credit needs of local entrepreneurs.

Empirical studies that have yielded negative impacts on growth include: a study by Chami *et al.* (2003), covering 113 countries found that remittances had a negative effect on growth which result was attributed to moral hazard and concluding that remittance incomes allow recipient families to work less consequently affecting labour supply and productivity. Similar results are reported by Karagöz (2009) who used time series data for Turkey for period of 1970 to 2005 and found the ratio of remittances to GDP to be negatively correlated to per capita GDP.

The growth elasticity of remittances was – 0.03 and the study concluded that the third generation in the Western Europe is not so inclined to remit and develop strong entrepreneurial skills.

Ratha and Mohapatra (2007) attribute these kinds of results to the fact that the effects of remittances on human and physical capital are realized over a very long time period. Secondly, the authors explain that there is difficulty associated with disentangling remittances counter-cyclical response to growth which implies that the causality runs from growth to remittances. Rocher and Pelletier (2008) note that positive and significant coefficients between remittances and long term growth are only identified when the variables relative to investment are excluded from estimations.

In Contrast, a study by IMF (2005) over a period of 1970 to 2003 for 101 countries found no statistic link between remittances and per capita output growth, or other variables such as education and investment rates and this was partly attributed to measurement difficulties. Adams and Page (2005) examined impacts of remittances on poverty in 71 developing countries. The results show that both international migration and remittances significantly reduce the level, depth and severity of poverty in these countries. Solimano (2003) reported a positive association between remittances and growth for a panel of Andean countries. Lastly, Faini (2002) found the impact of remittances on growth to be positive and argued that remittances overcome capital market imperfections and allow migrant households to accumulate positive assets.

However, a consensus is now emerging as regards the stabilizing effect of remittances on the growth of developing economies and their role as buffers (Rocher and Pelletier, 2008). This position should further be supported by more empirical studies. Remittances are more positively correlated to the weak economic performance of the recipient country. Remittances are likely to generate more of positive impacts on small size economies than their large counter part.

This would suggest that the motive behind most remittances is to compensate income loss following deterioration in the economic environment and the results are supported by the research by Chami *et al.* (2008).

In a study covering several Sub Saharan African countries, Fayissa (2008) observed that the coefficients of the lagged values of GDP per capita and changes in remittances have a significant and positive impact on the growth rate of African GDP per capita. Accordingly, a 10 percent increase in remittances was found to lead to a 0.04 percent growth in the GDP per capita of African economies. While accounting for the endogenous nature of the traditional growth explaining factors in the model in which the remittances are regressed against GDP per capita, Fayissa (2008) found that foreign direct investment (FDI), the terms of trade (trade openness) and the institutional variable proxied by the political rights index were not significant. On the other hand, investment in physical and the lag of human capital had significant growth enhancing roles.

2.3.2 Impact on Financial Sector Growth

Financial sector growth is also commonly referred to as financial sector deepening or financial depth. Several indicators are used by different scholars to study the impact of remittances on financial depth. Giuliano and Ruiz-Arranz (2005) while citing Levine *et al.,* 2000; and King and Levine, 1993; classified the measures of financial development into two broad categories i.e. those relating to the banking sector and the others relating to the stock market. For the current study, only those relating to the banking sector were used because of the interest in knowing whether remittances are associated with more money supply and lending by the banking sector. These indicators relating to the banking sector include: domestic bank credit to private sector as a ratio of GDP and domestic bank deposits as share of GDP/ deposit rates (Aggarwal *et al.,* 2006; Apaa – Okello and Anguyo, 2006).

Domestic bank credit to private sector measures the extent to which the private sector relies on banks to finance consumption, working capital, and investment. There are also other measures of financial depth used in literature and these are: liquid liabilities of the financial system (M2/GDP) and then Deposits/GDP (Giuliano and Ruiz-Arranz, 2005). M2 as a ratio of GDP equals currency plus demand and interest bearing liabilities of banks and non - financial intermediaries divided by GDP. It is considered as the broadest measure of financial intermediation and includes three types of financial institutions: the central bank, deposit money banks, and other financial institutions.

On the other hand, Deposits/GDP is the sum of demand, time, saving, and foreign currency deposits as share of GDP. It measures the ability of banks to attract financial savings and provide a liquid store of value. In addition to above, Kihangire and Katarikawe (2008) studied the impact of remittances on financial depth using three other proxies and these were: base money, broad money supply (M3), and Nominal Effective Exchange Rate (NEER). Lastly, domestic credit provided by the banking sector to GDP (CREDIT/GDP) is also used to proxy for financial depth, and measures how much intermediation is performed by the banking system, including credit to the public and private sectors (Giuliano and Ruiz-Arranz, 2005).

Little attention however, has been paid to whether remittances promote financial development in recipient countries (Aggarwal *et al.,* 2006). This has led to only speculations among policy makers and some scholars that remittances could lead to financial development in developing countries. The basis of this argument is the assumption that money transferred through financial institutions paves the way for recipients to demand and again access to other financial products such as credits which they would not have otherwise (Orozco and Fedewa, 2005). It is also believed that the lumpy nature of remittances encourage their recipients to seek and open bank accounts (Demirgüç-Kunt *et al.*, 2007, Aggarwal *et al.,* 2006).

When recipients use banks for their financial transfers, they may have an opportunity of learning about other financial services such as lending facilities, and interest rates on deposit accounts as well as on savings accounts (Aggarwal *et al.,* 2006).

Financial institutions are equally thought to benefit from remittance inflows. According to Demirgüç-Kunt *et al*. (2007), remittances can affect banking services in three ways: generate a transaction demand for financial services due to fixed costs involved in sending them. Banks also earn fees on remittance receipts contributing to profitability and then enable banks to screen potential credit clients. At sector level, remittances may increase opening up bank branches especially in rural areas having large numbers of remittance beneficiaries. Whereas remittances are likely to increase the willingness of the lender to supply loans by providing a stream of income with which loans can be repaid, they might substitute for credit among households with migrants abroad thereby decreasing the demand for loans (Demirgüç-Kunt *et al.*, 2007).

Whether and how remittances impact on financial development remains unclear (Aggarwal *et al.*, 2006). Some studies have generated results in which remittances are regressed against the measures of financial depth (Aggarwal *et al.,* 2006, Gupta *et al*., 2007, Apaa - Okello and Anguyo (2006). Others have tended to argue that remittances impact on financial depth via economic growth (Giuliano and Ruiz-Arranz, 2005 and Mundaca, 2005). It remains contentious whether remittances themselves promote financial development or it is a well – developed financial system that enhances remittance inflows in the economy. Empirically, Giuliano and Ruiz-Arranz (2005); and Mundaca (2005) have shown that the impact of remittances on growth is dependent on the level of financial development in a country. The two studies however yielded very different conclusions. Giuliano and Ruiz-Arranz (2005) used a panel of more than 100 countries for the period 1975-2003, and showed that remittances help promote growth in less financially developed countries.

They argue that this is evidence that agents compensate for the lack of development of local financial markets using remittances to ease liquidity constraints and to channel resources towards productive uses that foster economic growth.

Mundaca (2005) analyzed the effect of workers' remittances on growth in 8 countries drawn from Central America plus Mexico and the Dominican Republic using a panel data set for the period of 1970 to 2003. That study found out that controlling for financial development in the analysis strengthened the positive impact of remittances on growth. It was also concluded that financial development potentially leads to better use of remittances, and thus boosting growth. However, none of the two studies investigated the impact of remittances on financial sector growth. The current study deviated in order to contribute to the existing literature by exploring the impact of remittances on domestic bank credit to the private sector and money supply M3.

Aggarwal *et al.,* (2006) used Balance of Payment (BOP) data for the period of 1975 to 2003 to study the impact of remittances on financial development. The results of the study were that remittances had a positive coefficient with the size of coefficient in the bank deposits to GDP being as twice as large the coefficient of bank credit to private sector regressions. It also observed that 1% increase in the share of remittances to GDP suggested 0.5 – 0.6% increase in the ratio of deposits to GDP. The study revealed larger coefficient compared to findings of earlier studies which was justified as due to measurement error associated with officially recorded remittances.

Apaa - Okello and Anguyo (2006) analyzed cyclical response of remittance inflows to GDP deviations (Business cycles) for the period of 1992 – 2003 in Uganda and observed that remittance receipts were pro – cyclical to the real GDP.

Both coefficients of measurement of financial development were statistically significant at 5% level with domestic credit to private sector ratio being negatively correlated while domestic deposit rates positively correlated. Their study found out that remittance flows can be counter cyclical or pro – cyclical for countries, depending on economic characteristics underlying both the migrant sending country and the migrant host countries. It was also concluded that the level of financial development plays a major role in determining remittance flows to Uganda.

Aggarwal *et al.*, (2006) notes that studying remittances impact on financial development is complicated by the potential for endogeneity biases as a result of measurement error, reverse causation, and omitted variables. Measurement error arises from the poor quality of officially recorded remittances. Reverse causality is a concern because better financial development might lead to larger measured remittances either due to financial development that 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 inflows. Finally, omitted factors can explain both the evolution of remittances and financial development, also leading to biases in the estimated impact of remittances on financial development.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Area

The study focused on the three East African countries (that is, Uganda, Kenya and Tanzania) and five developed countries out of the ten topmost destinations where migrants from East Africa go. According to the World Bank fact book (2005), the leading six destinations of East African migrants in 2005 were United Kingdom, United States, Sweden, Germany, Australia and Canada. However, Canada as a migrant recipient country was dropped because it lacked data on some key variables like annual interest rates and wage rates. The rest of the five developed countries were considered for this particular study due to the fact that each of the six Eastern African countries sends a large number of emigrants to them. These countries also had readily available time series data.

3.2 Data Sources, Description and Data Analysis

This study used a data set compiled over a period of 21 years (1987 – 2007) for Kenya, 13 years (1995 – 2007) for Tanzania and 10 years (1998 – 2007) for Uganda. The varying country specific study periods were due to data limitations. The study used International Financial Statistics (IFS) database of 1994, 1996, 2003, 2007 and 2008 developed by International Monetary Fund (IMF). The IFS provides yearly statistical data classified according to international standards. Other data source included: the United Nations Statistics Division Common Database for the years covered by this study.

Data on imports and exports in Kenya, Uganda and Tanzania, nominal GDP at current prices, and real GDP at constant prices of 2000, were obtained from IFS (IMF, 1994, 1996, 2003, 2007 and 2008).

Other IFS data for the same data periods obtained from IMF were: Wholesale Producer price Index of the United States, country specific consumer price indices (CPI), annual bank lending rates, money supply (M3), claims on private sector and gross fixed capital formation (GFCF). Also host countries' Wage rates, GDP and their annual bank lending interest rates were obtained from IFS.

The data on remittances were obtained from migration and remittances fact book of the World Bank (2007) available on the website: www.worldbank.org/prospects/migrationandremittances. These data were constructed as the sum of three items in the *Balance of Payment Statistics Yearbook* (IMF): *workers' remittances* (current transfers made by migrants who are employed and resident in another economy); *compensation of employees* (wages, salaries and other benefits earned by nonresident workers for work performed for resident of other countries); and *migrant transfers* (financial items that arise from the migration or change of residence of individuals from one economy to another). Remittance values of the study countries for the data period stretching to 2007 were officially recorded figures obtained from the World Development Indicators.

Population of the East African countries, Foreign Direct Investment (FDI) and Real GDP of the migrant host countries were taken from the United Nations Statistics Division Common Database' section of Key Global indicators (2007). Estimates of GDP by the United Nations were used given the fact that the figures were given in a uniform and an internationally recognised dollar currency unlike the IMF figures that were reported in the respective national currencies.

The data were entered, coded and cleaned in Statistical Package for Social Scientists (SPSS) computer program. The data were then transferred to STATA version 9.0 in which empirical analysis were carried out.

Due to the anticipated reverse causality, the remittance variable in the model estimating the macro-economic determinants was introduced among the explanatory variables as a lagged variable. In the models estimating impact on output and financial sector depth, the predicted values of the remittance variable were used. This endogeneity along with heterogeneity arising from country specific effects underlying the traditional sources of economic growth renders the empirical analysis unsuitable for Ordinary Least Squares (OLS). Hence, all the models were estimated using Prais-Winsten regression; correlated panels corrected standards errors (PCSEs) models with panel specific AR (1).

Other than the dummy variables capturing country specific effects, the rest of the variables used in the study were taken in the natural logarithms. This natural logarithms transformation enables the regression to yield elasticities that are interpreted as percentage changes (Karagöz, 2009). Goodness of fit was determined by observing the chi square and the level of explanatory power of each empirical model determined by the Adjusted R Squared (R^2_{adj}). All variables were also subjected for unit root tests and co-integration within the panels.

3.3 Analytical methods

3.3.1 Determinants of worker's remittances

This study adopts the theoretical framework as used by Schiopu and Siegfried (2006). Assume a simple two-period model that describes the behaviour of a representative migrant born in the home country *i*, and working in the host (or remittance sending) country *j*. In the first period, migrant maximizes utility by allocating the income between costly transfers to her family in the home country, own consumption in the host country and savings. The migrant can acquire financial / non-financial assets in both host and home country, each of them yielding a certain rate of return. In the second period, the agent consumes the savings attained in the period before.

The migrant's problem can then be decomposed in two steps. First, given the earnings in the host country, the migrant decides how much to allocate to consumption, savings and transfers to own family. Second, given total savings, the migrant solves a portfolio allocation problem, by choosing the shares invested in the home and the host country. The first step of the representative migrant's problem is formalized as shown below following Schiopu and Siegfried (2006):

$$(1) \qquad \overset{Max}{C_1^i, C_2^i, X^{ij}}, \text{S}\geq 0 \ldots\ldots\ldots\ldots\ldots\ldots U_{i,j} = \left\{U\left(C_1^i\right) + \beta U\left(C_2^i\right) + \gamma U\left(C_1^j\right)\right\}$$

where $\beta \in (0,1]$ is the migrant's time discount rate, $\gamma \in (0,1]$ the degree of altruism towards her family; C_t^i migrant's consumption in country *i* at time $t(t=1,2)$, C_1^j denotes the migrant's family's consumption in country *j* and is defined as:

$$C_1^j = Y^j + X^{ij}$$

where Y^j is the family income in country j and X^{ij} the amount that the migrant working in country j sends to the family.

The migrant solves problem (1) subject to the following resource constraints:

(2) $C_1^i + \Omega X^{ij} + S = Y^i$

(3) $C_2^i = SxR$

where *S* is the amount saved out of the current income Y^i that the migrant earns in country *i* and *R* is the overall portfolio return. The constant $\Omega > 1$ can be thought of as a transfer cost. The sender pays Ω dollars for each dollar received by the beneficiary.

Assuming logarithmic utility and denoting $Y_d^i = Y^i - S$ as the income available for own consumption and family transfers, Schiopu and Siegfried (2006) show that the optimization problem above can be formulated as in the following Lagrangean function:

(4) $L = \ln\left(C_1^i\right) + \beta \ln\left(C_1^i\right) + \gamma \ln\left(Y^j + X^{ij}\right) + \lambda\left(Y_d^i - C_1^i - \Omega X^{ij}\right) + \left(SxR - C_2^i\right)$

Obtaining First Order Conditions (FOC) for C_1^i and X^{ij}:

$$\left(C_1^i\right) \quad \frac{1}{Y_d^i - \Omega X^{ij}} - \lambda \le 0 \ldots\ldots C_1^i \ge 0, \text{ with complementary slackness}$$

$$\left(X^{ij}\right) \quad \frac{1}{Y^j + X^{ij}} - \Omega\lambda \le 0, X^{ij} \ge 0, \text{with complementary slackness}$$

Logarithmic utility assures an interior solution for C_1^i so $\lambda = \frac{1}{Y_d^i - \Omega X^{ij}}$

The solution for X^{ij} is interior if degree of altruism is sufficiently strong: $\gamma > \frac{\Omega Y^j}{Y_d^i}$

Assuming family transfers different from zero, Schiopu and Siegfried (2006) express C_1^i and X^{ij} as a function of Y_d^i:

$$X^{ij} = \frac{\gamma Y_d^i - \Omega Y^j}{\Omega(1+\gamma)} = \frac{\gamma(Y^i - S) - \Omega Y^j}{\Omega(1+\gamma)} \tag{5}$$

$$C_1^i = Y_d^i\left(1 - \frac{\gamma}{\Omega(1+\gamma)}\right) + \frac{\Omega Y^j}{\Omega(1+\gamma)} = (Y^i - S)\left(1 - \frac{\gamma}{\Omega(1+\gamma)}\right) + \frac{\Omega Y^j}{\Omega(1+\gamma)} \tag{6}$$

Substituting (5) and (6) in (1) Schiopu and Siegfried (2006) show the indirect utility as a function of S:

$$\underset{S \geq 0}{\text{Max}} \; U_{ij} = \ln\{(Y^i - S)[\Omega(1+\gamma) - \gamma] + \Omega Y^j\} + \beta \ln(S) + \gamma \ln[Y^j \Omega\gamma + \gamma(Y^i - S)] \tag{7}$$

The optimal savings S^* is the solution of the following first – order condition

$$\frac{\Omega(1+\gamma) - \gamma}{(Y^i - S)(\Omega(1+\gamma) - \gamma) + \Omega Y^j} + \frac{\gamma}{Y^j \Omega\gamma + \gamma(Y^i - S)} = \frac{\beta}{S} \tag{8}$$

The left hand side of (8) is an increasing function of *S* and the right-hand side is decreasing in *S*. Therefore, equation (8) has a unique solution $S^* \in (0,1)$. S^* is an increasing function of Ω, while the amount of remittances sent to family back home, X^{ij} is decreasing in Ω. The second step of the optimization problem involves the decision regarding the portfolio allocation. That is, given the optimal savings amount S^* and the exogenous rates of return on assets in both countries R^i and R^j, the agent chooses the asset mix A^i and A^j that maximizes the return of her portfolio. Formally,

$$\text{Max} \; [A^i R^i + A^j R^j] \tag{9}$$
$$A^i, A^j, \geq 0$$

$$\text{Subject to } A^i + A^j[1 + f(A^j)] = S^* \tag{10}$$

where $f(x) = x^{\alpha}, \alpha \in (0,1)$ represents the cost of investing in home country assets. This cost is intended to capture not only the monetary costs (fees and charges of the financial institutions in the case of investment in financial assets) but also risks associated with imperfect monitoring or generally idiosyncratic risks not included in the return. For simplicity, the budget constraints above are expressed in terms of consumption goods in the sending country *j*.

The first-order conditions with respect to A^i and A^j obtained by Schiopu and Siegfried (2006) are:

$\left(A^i\right)$ $R^i - \lambda \leq 0, A^i \geq 0$ with complementary slackness;

$\left(A^j\right)$ $R^j - \lambda\left(1 + (1+\alpha)\left(A^j\right)^{\alpha}\right) \leq 0, A^j \geq 0$ with complementary slackness

It can be seen that $A^j = 0$ when $R^i = \lambda > R^j$ and $A^i = 0$ when $R^i < \dfrac{R^j}{1 + (1+\alpha)(S^*)^{\alpha}}$

The interior solution for A^i and A^j are:

(11) $$A^j = \left(\frac{R^j}{R^i(1+\alpha)}\right)^{1/\alpha} \text{ and } A^i = S^* - \left(\frac{R^j}{R^i(1+\alpha)}\right)^{1+\alpha/\alpha}$$

Thus, the total amount of remittances the representative migrant sends from country j to country i is:

(12) $$\text{Remit}_{ij} = X^{ij} + A^j = X^{ij}(\vec{Y}^i, \underline{Y}^j, \underline{\Omega}) + A^j(\vec{R}^j, \underline{R}^i)$$

Based on the above equilibrium relationship, Schiopu and Siegfried (2006) estimate the following remittances function:

(13) $$\text{Remit}_{ij,t} = f(Y_t^j - Y_t^i, R_t^j - R_t^i, \Omega)$$

where *Remit* are remittances per migrant, *i* and *j* indicate the receiving and sending country respectively and *t* is a time subscript. The first augment denotes the difference between real incomes of the migrant and her family back home, according to equation (5).

The second terms denote the rate of return differential for financial and possibly non-financial assets (real-estate) as given by the linearized version of equation (11). The effect of the income differential on the remittance inflows would be expected to capture either investment or altruistic motive to remit, while the effect of the two rates of return reflects the importance of self-interest behind the decision to remit. The final term is the cost of sending remittances between two countries.

This study modifies the Schiopu and Siegfried (2006) framework in equation (13), by introducing per capita GDP to proxy for domestic economic situation. Domestic real interest rate and the weighted real interest rate of host countries are introduced. Other variables included are: trade openness, lagged remittances, weighted external GDP that capture economic situations in the countries of emigrant destinations and the wage rate.

Hence the two model specifications are run as below:

(14) $$lnRemit_{ij,t} = \beta_0 + \beta_1\, lnlagRemit_{ij,t} + \beta_2\, lnPercapita_{i,t} + \beta_3\, ln\ Open_{i,t} + \beta_4\, lnReal\_int_{i,t} + \beta_5\, lnReal\_extint_{j,t} + \beta_6\, lnGDP\ \_ext_{j,t} + \beta_7\, lnINF + \varepsilon_{ij,t}$$

(15) $$lnRemit_{ij,t} = \beta_0 + \beta_1\, lnlagRemit_{ij,t} + \beta_2\, lnPercapita_{i,t} + \beta_3\, ln\ Open_{i,t} + \beta_4\, lnReal\_int_{i,t} + \beta_5\, lnReal\_extint_{j,t} + \beta_6\, lnGDP\ \_ext_{j,t} + \varepsilon_{ij,t}$$

Where:

- $lnRemit_{ij,t}$ is total remittances from host countries (j) to the East African country (i) in year t expressed as a share of real GDP of the respective EA countries;
- $lnlagRemit_{ij,t}$ is lagged total remittances (initial remittance inflows also expressed as a share of GDP) from respective host to domestic countries in period t.
- $lnPercapita_{it}$ is the domestic real per capita GDP in year t in billions of US Dollars obtained by dividing the real GDP by the population standardized in billions of people.

- $lnopen_{it}$ is domestic trade openness in year t, expressed as a ratio of the sum of exports and imports in billions of US Dollars to the real GDP in the respective EA countries.
- $lnReal\_int_{i,t}$ *is* domestic real interest rate obtained by subtracting inflation rate from nominal domestic interest rates within the specific EA states i in year t. The inflation rate was computed as the annual percentage change in Consumer Price Index (CPI) transformed in constant US dollars using a base year of 2000.
- $lnGDP\_ext_{j,t,}$ is the weighted real GDP of the migrant host economies js and is used as a proxy of economic situations in developed countries. It is obtained by summing up the ratios of individual host country real GDP over the total real GDPs of the 5 emigrant host countries existing in the list of the top 10 emigrant host countries for the period t.
- $lnReal\_extint_{j,t}$, is external real interest rates for 5 top emigrant host countries achieved by multiplying the ratios of GDP of respective country j over sum total GDP by their respective real interest rates for the period t which are then summed up. Real interest rate computed as explained above.
- $lnINF_{i,t}$ is inflation rate calculated as the annual percentage change in the Consumer Price Index (CPI).
- $\varepsilon_{ij,t,}$ is the error term

A priori expectation would be as follows: $lnlagRemit_{ij,t,}$ a positive sign because remittance funds in a previous period can be used to finance a new migration prospect and enhance remittance capacity. Per capita GDP ($lnpercapita_i$) as an indicator of economic development is expected to be positive since for small economies like East African states, investment motives are likely to dominate migrant decisions to send remittances (El Mouhoud *et al*., 2008). Trade Openness (*lnOpen*) is expected to be negative because a higher degree of international integration of the real sector makes the export of labor forces - which is a precondition for remittances - less attractive.

Domestic interest rate ($lnReal\_int_i$) should have a positive coefficient as migrant workers would be willing to send home money so as to earn more interest, lnReal_extint$_{j,t}$ a negative sign expected due to the fact that a high interest rate in host country would discourage the migrant to send money home for investment purposes. External GDP (lnReal_extint$_{j,t}$), *a* proxy for economic condition abroad should be positive because if these conditions are good, employment opportunities are generated that attract migrant workers to earn more and remit. Inflation rate ($lnINF_{i,t}$), represents macro-economic instability and is expected to be negative.

3.3.2 Impact of Remittances on Economic Output: Empirical Model

This study follows the framework by Jongwanich (2007) who investigates the role of remittances on economic growth based on the extended version of the neoclassical model by Barro (1996). Within this framework, the economic growth equation is expressed as follows:

$$g_{it} = C_0 + C_1 Y_{i,t-1} + C_2 H_{it} + C_3 I_{it} + C_4 Remit_{it} + C_5 X_{it} + \eta_i + \varepsilon_{it} \quad (16)$$

where g is economic growth, Y_{t-1} is the initial GDP per capita, H is the human capital, I is the investment, *Remit* is remittances, X is a set of choice and environmental variables that affect economic growth, η is an unobserved country-specific effect and ε_{it} is the error term. Following Barro (1996), Barro and Sala-i-Martin (1995) and Giuliano and Ruiz-Arranz (2005), other variables in X includes: government consumption (*Gov*), openness (*Open*), and inflation (*Inf*).

Fayissa (2008) also determines the responsiveness of income growth rate to remittances and other traditional sources (variables) of economic growth. The variables used in that study were: investment in physical and human capital an external source of capital represented by foreign aid, and openness of the economy as measured by the ratio of the sum of imports and exports to the GDP, often proxied by the terms of trade. The rest were: foreign direct investment (FDI), a measure of an institutional factor often represented by the economic and political freedom index and the impact of the initial per capita income. The study specified a simple double log-linear Cobb-Douglas production function as below:

$$(17) \qquad GDP_{i,t} = \beta_0 + \beta_1 REM_{,it} + \beta_2 GCF_{i,t} + \beta_3 AID_{i,t} + \beta_4 ENR_{i,t} + \beta_5 FDI_{i,t} + \beta_6 TOT_{i,t} + \beta_7 INY_{i,t} + \beta_8 PRI_{i,t} + \varepsilon_{i,t}$$

Where $GDP_{i,t}$ is the natural log of real GDP per capita and $REM_{i,t}$ is log of remittances per capita in US$; $GCF_{i,t}$ is the log of gross fixed capital formation as a percent of real GDP used as a proxy for investment in physical capital. $ENR_{i,t}$ is log of secondary school enrollment used as measure of investment in human capital. The log of foreign aid ($AID_{i,t}$) was used to capture the impact of an external source of capital on economic growth. $FDI_{i,t}$ is the log of foreign direct investment used to capture the effect of external sources of capital on growth; $TOT_{i,t}$ is the log of the terms of trade for each country under consideration, measured by the ratio of the export to import price indices to capture the impact of trade, or openness of the economy on economic growth. $PRI_{i,t}$ is log of a measure of the political rights index.

This study estimates variants of the models in (16) and (17) shown in the equations (18) and (19). This study differs from earlier studies by using predicted remittances (*lnRemit_hat*) variable which also takes care of the endogeneity problem while estimating the parameters.

(18) $$lnpercapita_{it} = C_0 + C_2 lnRemit\_hat_{it} + C_1 lnINV_{it} + C_3 lnOpen_{it} + C_4 lnlagINF_{it} + \eta_i + \varepsilon_{it}$$

(19) $$lnGDP_{it} = C_0 + C_2 lnRemit\_hat_{it} + C_1 lnINV_{it} + C_3 lnOpen_{it} + C_5 lnlagINF_{it} + \eta_i + \varepsilon_{it}$$

Where:

- $lnpercapita_{it}$ is representing per capita GDP and $lnGDP_{it}$ is income level of the migrant sending country,
- lINV_{it} is domestic investment proxied by gross fixed capital formation as a ratio of real GDP
- $lnRemit\_hat_{it}$ is the predicted value of remittances receipts as share of GDP
- *lnOpen* is trade openness measured as sum of exports and imports over GDP
- $lnlagINF_{it}$ is the inflation rate,
- η_i is the variable capturing unobserved country specific effects as dummies; dug, dke and dtz for Uganda, Kenya and Tanzania respectively.
- ε_{it} is the error term, i is country observation and t is time period.
- C_i are the various coefficients to be estimated.

The expected signs of the coefficients of variables are as follows: lINV_{it} is expected to be positive since investment improves growth and $lnRemit\_hat_{it}$ should also be positive. Likewise $lnOpen_{it}$ is expected to be positive. For inflation rate ($lnINF_{it}$), the sign should be negative because the inflation represents macro – economic instability that reduces growth.

3.3.3 Impact of Remittances on Financial Sector Depth: Empirical Model

Chami *et al*. (2008) points out that the presence of remittance inflows in the home country tends to increase the supply of funds faced by the domestic banking system. This increase in private transfers lowers the cost of borrowing for banks, and with the marginal cost of intermediation held constant, reduces the cost of funds for the banks' private and public borrowers. Besides as lumpy income flows, remittances generate a transactions demand for financial services depending on the level of institutional development as proxied by per capita GDP (Demirgüç-Kunt *et al.* 2007; Aggarwal *et al.,* 2006). The implication is that remittance inflows increase conventional measures of financial development such as the ratio of M2 or M3 to GDP or the ratio of credit to the private sector to GDP (Chami *et al*., 2008). Following Aggarwal *et al.* (2006), the relationship between financial development and remittances can be written as:

$$FD_{i,t} = \beta_1 Remit_{i,t} + \beta_2 X_{i,t} + \alpha_i + u_{i,t} \quad (20)$$

Where *i* refer to the country and *t* refers to the time periods of observation. *FD* is financial development referring either to the ratio of bank credit to the private sector over GDP or the share of bank deposits expressed as a percentage of GDP and these are the standard measures of financial depth used in the literature (King and Levine, 1993). *Remit* refers to the ratio of remittances to GDP. The vector *X* refers to a set of variables that the literature has found to affect financial development such as country size, defined as the log of GDP in constant dollars, and the level of economic development, as measured by Per capita GDP. It is argued that financial sector development requires paying fixed costs that become less important the larger the size of the economy and the richer the country.

Per capita GDP is used to proxy for the quality of legal institutions in the country which have been shown to have a positive impact on financial development. The model also includes inflation, measured as the annual percentage change in the GDP deflator. Studies have shown that inflation distorts economic agents' decision making regarding nominal magnitudes, discouraging financial intermediation, and promoting saving in real assets (Boyd, *et al.*, 2001). Current and capital account openness are normally included as control variables and have been found to have a positive effect on financial development (Chinn and Ito, 2002).

In this study, two dependent variables commonly used in literature as measures of financial depth have been employed namely: broad money supply (M3) as used in Kihangire and Katarikawe (2008). The other dependent variable is credit to private sector as ratio of GDP (used in Demirgüç-Kunt *et al*. (2007), Gupta *et al.* (2007); Aggarwal *et al. (*2006); and Apaa – Okello and Anguya (2006)). For the dependent variable of credit to private sector, this study has two regressions; one without the lagged dependent variable and the second regression with the lagged dependent variable. The three models are specified as follows:

(21) $$lnRM3_{i,t} = \alpha_0 + \alpha_1 lnRemit\_hat_{i,t} + \alpha_2 lnOpen_{i,t} + \alpha_3 lnINV_{i,t} + \alpha_4 lnlagINF_{i,t} + \gamma i + \mu_{i,t}$$

(23) $$lnCR\_PRVT_{i,t} = \alpha_0 + \alpha_1 lnlagCR\_PRVT_{i,t} + \alpha_2 lnRemit\_hat_{i,t} + \alpha_3 lnOpen_{i,t} + \alpha_4 lnINV_{i,t} + \alpha_5 lnlagINF_{i,t} + \gamma_i + \mu_{i,t}$$

(22) $$lnCR\_PRVT_{i,t} = \alpha_0 + \alpha_1 lnRemit\_hat_{i,t} + \alpha_2 lnOpen_{i,t} + \alpha_3 lnINV_{i,t} + \alpha_4 lnlagINF_{i,t} + \gamma_i + \mu_{i,t}$$

Where:

- $RM3_{i,t}$ *and* $lnCR\_PRVT_{i,t}$ are the different measures of financial depth used in the study for home country i and period t. *RM3* is the ratio of money supply M3 to GDP while *lnCR_PRVT* represents credit to private sector over GDP.
- $lnlagCR\_PRVT_{i,t}$ is one year lagged variable of credit to private sector. This lag dependent variable is included in the regression because the improvement in the efficiency of the financial sector in the current period is also enhanced by policies and development of the financial sector in the previous period (Shahbaz *et al.,* 2007). It is expected that remittances increase the efficiency of financial markets.
- $lnRemit\_hat_{i,t}$ is predicted variable of remittances as share of GDP as explained in the previous sub section. Similarly, the controls variable namely: $lnOpen_{i,t}$, $lnINV_{i,t}$ and $lnlagINF_{i,t}$ are as used in the empirical examination of impact of remittances on level of economic output. α_i are coefficients to be estimated,
- γ_i is the variable capturing country specific effect dummies namely dug, dke and dtz for Uganda, Kenya and Tanzania
- $\mu_{i,t}$ is the error term.

$lnlagCR\_PRVT_{i,t}$ coefficient is expected to be positive because remittances when channeled through banks positively impact on deposits and credit available for investment. $lnRemit\_hat_{i,t}$ (predicted remittances) is expected to positively impact on financial development because anticipated remittances could trigger more financial development. $lnINV_{i,t}$ is expected to be positively associated to financial depth. $lnOpen_{i,t}$ is expected to be positively associated to financial development, $lnlagINF_{i,t}$ represent macroeconomic instability which negatively affects the banking sector.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Unit Root Tests

The study uses the panel unit root tests proposed by Levine *et al*. (2002) (LCC) which allows for heterogeneity of the intercepts across members of the panel. This test is constructed by averaging individual augmented Dickey-Fuller (ADF) t- statistics across cross-section units. The LLC test is of the null hypothesis that each individual time series in the panel is integrated against the alternative hypothesis that all individual time series are stationary. The test is based on the following pooled ADF equation:

$$\Delta y_{it} = X'_{it}\alpha + \delta y_{it-1} + \sum_{L=1}^{pi} \beta_{ij} \Delta y_{it-L} + \varepsilon_{it} \quad (24)$$

Where a common $\delta = \rho - 1$ is assumed, X_{it} represents the exogenous variables in the models, including any fixed effects or individual trends. The null hypothesis H_0 is $\delta = 0$ under the assumption that $\delta_i = \delta$ for all *i* is tested against the alternative hypothesis, H_1 that $\delta < \delta_i$ for all *i*. The results of LLC test are presented in Table 4.1.

Table 4.1 Tests for Unit Roots (LLC)

Variable	Level		First Differencing	
	t-value	**p-value**	**t-value**	**p-value**
lnRemit	0.434	0.668	-16.657	0.000
lnpercapita	-0.029	0.489	-9.854	0.000
lnINV	0.787	0.785	-6.689	0.000
lnOpen	3.605	0.999	-2.055	0.019
lnReal_Int	-1.200	0.115	-2.778	0.002
lnReal_ext	-0.061	0.476	-3.481	0.000
lnGDP_ext	-0.225	0.411	-3.156	0.001
lnINF	0.152	0.560	-5.822	0.000
lnRM3	5.048	1.000	-5.335	0.000
lnCR_PRVT	4.857	1.000	-5.554	0.000
$lnGDP_i$	2.796	0.997	-46.152	0.000

The null hypothesis is that all variables are non-stationary.

The results in Table 4.1 indicate that all variables are integrated of order one, I (1).

4.2 Panel Co-integration Tests

Co-integration is also tested for all the series used in the study. The test followed Kao (1999) method of testing for the residuals, $\hat{e}_{it}$ of the OLS panel estimation by ADF-type tests i.e;

(25) $$\hat{e}_{it} = \hat{e}_{it}\,\rho_{it-1} + \sum_{j=1}^{p}\phi_j \Delta \hat{e}_{it-j} + v_{it}$$

The null hypothesis of no co-integration, H_0 is $\rho = 1$, tested against the alternative hypothesis of stationary residuals, H_1: $\rho < 1$. Table 4.2 shows results of co-integration tests done following Kao (1999). ρ is estimated as shown below:

(26) $$\rho = \frac{\sum_{i=1}^{N}\sum_{t=2}^{T} \hat{e}_{it}\,\hat{e}_{it-1}}{\sum_{i=1}^{N}\sum_{t=1}^{T} \hat{e}_{it}^{\,2}}$$

Table 4.2 Co-integration tests

Series in the lists: *lnRemit, lnpercapita, lnINV, lnOpen, lnReal_Int, lnReal_ext, lnGDP_ext, lnINF, lnRM3, lnCR_PRVT, lnGDP$_i$*		
ADF	**t-value**	**p-value**
	-5.156	0.000
Residual variance	0.136	
HAC variance	0.034	

Note:
Null Hypothesis: No co-integration
Trend assumption: No deterministic trend
Automatic lag length selection based on Schwarz Information Criterion with a max lag of 1
Newey-West automatic bandwidth selection and Quadratic Spectral kernel

The results in Table 4.2 indicate that the hypothesis of no co-integration among the variables is rejected at 1% level of significance. Thus the variables are co-integrated.

4.3 Factors Influencing Remittance Inflows

Results of the two models estimating macro – economic determinants of remittance inflows in East Africa using Prais-Winsten regression, correlated Panels Corrected Standard Errors (PCSEs), with panel specific AR(1) are as presented in Table 4.3. For the model with inflation rate variable (*lnINF*), the results indicated that the coefficients on lagged remittances, per capita GDP, domestic real interest rates and external GDP carried the expected positive signs and were all statistically significant.

Table 4.3 Determinants of Migrant Workers' Remittances (Prais-Winsten regression PCSEs Results)

Dependent Variables: *lnRemit*								
	Model With lnINF				***Model Without lnINF***			
Explanatory Variables	Coefficient	Standard Error	Z	P>|Z|	Coefficient	Standard Error	Z	P>|Z|
lnlagRemit	0.317	0.106	2.99	0.003	0.370	0.096	3.87	0.000
lnPercapita	8.656	1.266	6.84	0.000	6.531	1.071	6.10	0.000
lnOpen	-2.560	0.432	-5.92	0.000	-1.990	0.333	5.98	0.000
lnReal_Int	1.467	0.599	2.45	0.014	1.430	0.412	3.47	0.001
lnReal_extint	-1.287	0.444	-2.90	0.004	-0.846	0.388	-2.18	0.029
lnGDP_ext	7.895	1.253	6.30	0.000	5.740	1.115	5.15	0.000
lnINF	-0.135	0.105	-1.28	0.200	-	-	-	-
Constant	-125.808	16.6109	-7.57	0.000	-95.550	14.5553	-6.56	0.000
Observations	40.000				43.000			
Wald chi 2 (8)	126.040				142.37			
Prob> chi Sq.	0.000				0.000			
R^2	0.908				0.962			
Adj R^2	0.888				0.956			

External real interest rate and trade openness were also significant and had negative signs as theoretically expected. Inflation rate was the only variable not significant at any level but still had a

negative sign. In the alternative model, in which *lnINF* was dropped, signs on the coefficients and the statistical significance remained the same. However, the sizes of magnitudes of coefficients on most variables in the former model were relatively bigger. It was generally observed that the model with *lnINF* outperformed its counterpart model. The measure of goodness of fit in the two models (Prob> chi square was 0.000) meant that either models fitted well their respective data. On the basis of this measure, the two models were highly significant.

It can therefore be concluded that the specified models adequately explained remittance macro – economic determinants and thus the study can not reject the null hypothesis that domestic per capita GDP, domestic real interest rates and the level of economic activity in developed countries positively and significantly influence remittance inflows in the East African countries. The coefficients of determination (Adj R^2) in the model with *lnINF* and the other without, were 0.888 and 0.956 meant that the two model specifications had strong explanatory power, explaining 88.8% and 95.6% of the variation in around the mean respectively.

Since the two models yielded findings which did not differ significantly in terms of making economic meaning, the model with *lnINF* was preferred for the interpretation of coefficients as it had outperformed its counterpart model. Hence, the coefficient on lagged remittances (0.317) implied that a 1% increase in remittances received in previous year caused an increase in remittance inflows of 0.317% all else constant. This means that remittance receipts in the current period are highly dependent on remittances earned in the previous period. It is partly attributed to the fact that earned remittances are likely to be used to finance additional migration resulting into an increased stock of emigrants abroad who remit more money.

The coefficient of per capita GDP was 8.656 meaning that 1% rise in the level of per capita GDP would cause an increase in remittance inflows of 8.656% all else constant.

It should be recalled that per capita GDP is an indicator of institutional development and thus the higher the level of institutional development the more remittances are likely to be received by a country. Domestic real interest rate would increase remittances by 1.467% when increased by 1% while real interest rates in developed countries would reduce remittances by 1.287% holding other factors constant. On the basis of these results and as highlighted in literature, the motive to remit in East Africa could be inclined more for investment purposes than altruism or consumption smoothing. These findings were consistent with reported results of Aydas *et al.* (2004).

Trade openness proxied by the sum of exports and imports over GDP had a coefficient of -2.560 meaning holding all other factors constant, a 1% increase in trade openness would lead to a decline in remittance inflows by 2.560%. This also explains that openness as a degree of economic integration of the real sector could be generating relatively remunerative employment opportunities in domestic economies which makes export of labour less attractive. Thus, increased openness could be negatively affecting the export of labour forces in East Africa, a precondition for remittances inflows. Economic activity in developed countries (*lnGDP_ext* was 7.895) implying that a 1 % rise in host country economic activity results into 7.895% increase in remittance inflows in migrant sending countries all else constant. It is assumed that good economic conditions in developed countries generate better employment opportunities which attract migrant outflows and consequently improve migrant remittance capacity.

4.4 Remittances and Economic Output

Two separate models were used to examine the impact of the workers remittances on output; one with domestic per capita GDP (*lnPercapita*) and the other with domestic real GDP ($lnGDP_i$) as dependent variables.

Results of Prais-Winsten regression, correlated panels corrected standard errors, with panel specific AR(1) models are presented in Table 4.4. They indicate that both empirical models were of a good fit.

Table 4.4 Remittances and Economic Output (Prais-Winsten regression PCSEs) - Fixed Effects Results

	Dependent Variables:							
	***lnPercapita* (country of Origin)**				***lnGDP$_i$* (County of Origin)**			
Explanatory Variables	Coefficient	Standard Error	Z	P>|Z|	Coefficient	Standard Error	Z	P>|Z|
lnRemit_hat	0.036	0.013	2.85	0.004	0.033	0.013	2.65	0.008
lnINV	0.101	0.031	3.24	0.001	0.040	0.048	0.84	0.401
lnOpen	0.054	0.025	2.16	0.031	0.329	0.039	8.33	0.000
lnlagINF	-0.006	0.007	- 0.86	0.387	-0.006	0.007	-0.93	0.354
dke	0.241	0.018	13.25	0.000	0.244	0.038	6.45	0.000
dtz	-0.051	0.053	-0.96	0.337	0.082	0.126	0.66	0.512
Constant	6.368	0.099	64.01	0.000	3.949	0.165	23.89	0.000
Observations	39.000				39.000			
Wald chi 2 (8)	411.96				275.46			
Prob> chi Sq.	0.000				0.000			
R-squared	0.999				0.995			
Adj R^2	0.9988				0.994			

Based on the Adjusted R^2 and the p-value of the Chi-square of 0.000, the two models adequately explained the impact of remittance inflows and the macro-economic variables on economic output of East African countries. The adjusted R^2 in the model with per capita GDP and Real GDP was 0.9988 and 0.994 meaning that these models were respectively explaining 99.88% and 99.4% of the variation in the dependent variable.

In the model with per capita GDP, predicted remittances (*lnRemit_hat*), investment (*lnINV*) and trade openness (*lnOpen*) had expected positive signs and were all significant at 1% level.

Only lagged inflation rate (*lnlagINF*) was not significant but still carried the expected negative signs. The model with $lnGDP_i$ as dependent variable was equally highly significant and so it ably explained the impact of predicted remittances on the level of output. Therefore, the null hypothesis that remittances positively and significantly affected the level of economic output could not be rejected. The dummy variables capturing unobservable country specific effects for Kenya (*dke*) and Tanzania (dtz) were 0.241 and -0.051, however dtz was not significant. The dummy variable for Uganda (*dug*) was dropped due to collinearity. It was also observed that the model with *lnpercapita* performed better than the corresponding model $lnGDP_i$ as dependent variable since its coefficients were bigger.

In terms of elasticities, the model with per capita GDP as dependent variable indicated that 1% rise in predicted remittances and investment holding other factors constant for each of these variables would cause an increase in per capita GDP of 0.036% and 0.101% respectively. Fayissa (2008) reported closely similar results however with differences in the magnitude of the estimated coefficients. Predicted remittances as well as investment also generate increased economic output. Trade openness had a coefficient of 0.054; its positive sign was consistent with theoretical expectation. This indicated that a 1% increase in the level of trade openness in East Africa would increase per capita GDP by 0.054%. Inflation rate (*lnlagINF*) as a measure of macro – economic instability exhibited a coefficient of -0.006. Since the inflation variable in the model was not significant at any level, the finding was treated as inconclusive. In the model with $lnGDP_i$ as dependent variable; predicted remittances, investment and trade openness carried expected positive signs. Apart from the investment variable, the other two variables were statistically significant. Again *lnlagINF* concurred with theoretical expectation of the negative sign but still inconclusive.

4.5 Remittances and Financial Sector Depth

Two separate models were run to test for the impact of remittances on financial depth, one involving use of money supply (M3) as a ratio of GDP and another credit to private sector over GDP. In both models, remittances were observed to affect financial depth positively and significantly

4.5.1 Impact of Remittance Inflows on Broad Money Supply (M3)

Using the Prais-Winsten regression with correlated panels corrected standard errors (and panel specific AR(1)), this study obtains results shown in Table 4.5.1.. Only lagged inflation rate was not significant at any level in the model though the negative sign was consistent with theory.

Table 4.5.1 Remittances and Money Supply M3: Fixed Effects Results

Dependent Variable: lnRM3 (Ratio of M3 to GDP)				
Explanatory Variable	Coefficient	Standard Error	Z	P>|Z|
lnRemit_hat	0.064	0.017	3.80	0.000
lnINV	0.425	0.067	6.31	0.000
lnlagINF	-0.003	0.010	-0.29	0.770
lnOpen	0.474	0.041	11.49	0.000
dtz	0.361	0.064	5.61	0.000
dke	0.588	0.036	16.27	0.000
Constant	1.426	0.139	10.23	0.000
Observations	39.000			
Wald chi 2 (8)	2228.59			
Prob > chi Square	0.000			
R^2	0.974			
Adj R^2	0.969			

The rest of the explanatory variables namely; predicted remittances (*lnRemit_hat*), investment (*lnINV*) and trade openness (*lnOpen*) were positive and statistically significant at 1% level.

Furthermore, dummy variables capturing specific unobservable country effects dtz (0.361) and *dke* (0.588) as well as the constant (1.426) were positive and significant at 1% level. The dummy variable for Uganda, dug was dropped from the regression due to collinearity. Based on the overall significance of the model (Prob> Chi Square = 0.000) and Adjusted R^2, it is worthwhile to conclude that the model appropriately explains the impact of remittance inflows and other macro-economic variables on broad money supply, M3. The adjusted R^2 was 0.969, meaning the model specification was explaining 96.9% of the variation in the dependent variable.

The results showed marginal impacts as follows: 1% rise in predicted remittances caused an increase in money supply M3 of 0.064% all else constant. Kihangire and Katarikawe (2008) also reported remittances to affect M3 positively in Uganda. Similarly, 1% increase in investment and trade openness raise M3 by 0.425% and 0.474% respectively ceteris paribus. This suggests that investment and trade openness could be having multiplier effects in the domestic economy which generates more money in circulation and that held as bank deposits. Previous studies like Gupta *et al*. (2007) used M2 instead of M3 and found M2 to be positively influenced by remittances and trade openness.

4.5.2 Remittances and Credit to Private Sector

In an alternative measure of financial depth, two empirical models were run, one model with a lagged variable of the dependent (lagged credit to private over GDP) included among the explanatory variables and the second model without a lagged dependent variable. Results are shown in Table 4.5.2. Remittances, investment and trade openness carried the positive signs and were all significant. In model with lagged dependent variable, *lnlagCR_PRVT* was also positive and significant.

Table 4.5.2 Remittances and Credit to Private Sector: Fixed Effects Results

Dependent Variable*: lnCR_PRVT* (Ratio of Credit to Private Sector over GDP)								
Explanatory Variables	**Model with *lnlagCR_PRVT***				**Model without *lnlagCR_PRVT***			
	Coefficient	Standard Error	Z	P>|Z|	Coefficient	Standard Error	Z	P>|Z|
lnlagCR_PRVT	0.403	0.176	2.29	0.022	-	-	-	-
lnRemit_hat	0.181	0.065	2.77	0.006	0.205	0.050	4.07	0.000
lnOpen	0.377	0.215	1.76	0.079	0.793	0.105	7.53	0.000
lnINV	0.771	0.172	4.49	0.000	0.728	0.147	4.97	0.000
lnlagINF	-0.008	0.030	-0.27	0.791	-0.020	0.029	-0.69	0.493
dtz	0.678	0.222	3.05	0.002	0.624	0.222	2.81	0.005
dke	0.974	0.259	3.76	0.000	1.492	0.074	20.16	0.000
Constant	3.422	0.953	3.59	0.000	5.140	0.373	13.77	0.000
Observations	37.000				39.000			
Wald chi 2 (8)	1860.970				2506.360			
Prob> chi Sq.	0.000				0.000			
R^2	0.975				0.966			
Adj R^2	0.969				0.960			

In either model, the measures of goodness of fit were prob> chi square = 0.000 and the values of adjusted R^2 were high meaning the two models appropriately explained the impact of predicted remittances on credit to private sector. Hence, the study could not reject the null hypothesis that predicted remittances positively and significantly affected credit to private sector.

The model with *lnlagCR_PRVT* variable had the adjusted R^2 of 0.969 meaning the model was explaining 96.9% of the variance while in the corresponding model without lagged variable the adjusted R^2 was 0.960 implying that it was explaining 96.0% of the results. Thus, the model without a lagged variable outperformed its counterpart model. The second model without *lnlagCR_PRVT* was also very significant. Other than inflation rate, the rest of the variables namely: *lnRemit_hat*, *lnOpen*, and *lnINV* were found to be statistically significant. The dummy variables *dtz* (0.678) and *dke* (0.974) and the constant (3.422) were again positive and significant.

In the model with a lagged variable, *lnlagCR_PRVT* coefficient (0.403) was positively associated with *lnCR_PRVT* and significant at 1% level meaning an increase in the value of credit to private sector attained in previous period raises current credit to private sector by 0.403% ceteris paribus. Shahbaz *et al* (2007) reported similar results when the lagged variable of credit to private sector was tested against credit to private as a measure of financial depth. The positive association of the lagged measure of financial depth indicates that improvement in the efficiency of the financial sector in the current period is enhanced by the policies and development of the financial sector in the previous period.

The variable of interest *lnRemit_hat* coefficient (0.181) was also positive and significant at 1% level suggesting that 1% rise in predicted remittances raises credit to private sector by 0.181% all else constant. This finding is consistent with theory that remittances are likely to increase bank liquidity. Although, Shahbaz *et al.* (2007) and Demirgüç-Kunt *et al.* (2007) used remittances over GDP in their studies in place of predicted remittances, they all found remittances to increase credit to private sector. The coefficient of *lnINF* (-0.008) carried the expected sign but was not significant. Again inflation was inconclusive as earlier discussed.

Coefficients of *lnOpen* (0.377) and *lnINV* (0.771) indicated a positive association between these two variables with credit to private sector and they were all significant. These elasticities are in line with theory and suggest that 1% increase in the level of trade openness and investment resulted into a rise in the credit to private sector of 0.377% and 0.771% respectively. Developments in the two variables could be responsible for increased generation of bank liquidity which is used for credit market development in the economies of East Africa.

Interestingly, results in the model without *lnlagCR_PRVT* were closely related to those attained in the counterpart model. Still the elasticities of *lnRemit_hat* (0.205), *lnOpen* (0.793) and *lnINV* (0.728) showed a positive relationship with credit to private sector. The coefficients for country specific effects *dke* (1.492) and *dtz* (0.624) and the constant (5.140) were still positive and significant. It was also noted that the coefficient of predicted remittances in the model without *lnlagCR_PRVT* was slightly bigger while that of the constant was almost doubling the size of the same coefficient in the alternative model.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The study aimed to examine the impact of migrant workers' remittances on East African economies that include: Uganda, Kenya, and Tanzania. Specifically, the study determined macroeconomic factors influencing remittances inflows in East Africa. It also established the impact of remittances on economic output and financial depth. Results show that Per capita GDP (*lnPercapita*), lagged remittances (*lnlagRemit*), domestic real interest rates (*lnReal_Int*) and economic activity in host countries (*lnGDP_ext*) are the major factors positively influencing remittances inflows in East Africa. Trade openness (*lnOpen*) and real interest rates in developed countries (*lnReal_ext*) negatively affected remittance inflows. Per capita GDP, lagged remittances and real domestic interest rates and the level of economic activity in migrant host countries are likely to increase remittances inflows while a high degree of trade openness is expected to decrease the inflow of the same financial transfers.

For economic output, the model with lagged variable revealed that lagged per capita GDP (*lnlagPercapita*), predicted remittances (*lnRemit_hat*), trade openness (l*nOpen*), investment (*lnINV*) were positively (as expected) and significantly impacting on per capita GDP. It was only inflation rate (*lnINF*) that yielded inconclusive finding. In the alternative model with real GDP (*lnGDPi)* as dependent variable predicted remittances (*lnRemit_hat*), trade openness (l*nOpen*), and investment (*lnINV*) positively affected the level of output though investment variable was not significant.

The three empirical models regressed to determine the impact of remittances on financial depth also yielded interesting results. Estimated coefficients of predicted remittances, investment, and trade openness were found to positively influence the level of M3 and statistically and were all significant. In an alternative measure of financial depth; credit to private sector over GDP, the model with lagged variable showed that lagged credit to private sector (*lnlagCR_PRVT*), predicted remittances (*lnRemit_hat*), trade openness (*lnOpen*), and investment (*lnINV*) were all positive and significant. Only inflation was not significant but still its coefficient was negative as expected. In the model without *lnlagCR_PRVT*, again *lnRemit_hat*, *lnOpen* and *lnINV* showed a positive relationship with credit to private sector.

5.2 Conclusion

Remittance inflows in East Africa are mainly increased by the level of institutional development, former remittance amounts, domestic real interest rates and the level of economic activity in developed countries and reduced by the degree of international integration of the real sector. On the basis of these findings, it is generally inferred that remittances decisions are more likely to be inclined to investment motives rather than mere altruism. The fact that remittance receipts are dependent on their past amounts means that these financial inflows are also used to finance future migration prospects that enhance the remittance capacity.

Furthermore, emigrants find it paying to send remittances in East Africa with increasing returns on investments in financial and non – financial assets as demonstrated by the positive response of remittances to domestic real interest rates. The high degree of economic activity in developed countries seems to provide good employment opportunities that attract migration and facilitate private transfer inflows.

These findings on macro – economic variables imply that governments in East Africa can influence the remittance inflows by means of appropriate macro – economic policies. Remittance receipts in East Africa were also found to increase the level of output and improve financial sector deepening through money supply and bank liquidity that generates funds for credit. This positive impact on the output and financial sector deepening imply that remittance inflows are a source of capital for economic development in East Africa just like Foreign Direct Investment, foreign aid and loans from abroad. The positive impacts in either case are more likely to be enhanced when remittances are effectively channeled to productive investment or when their consumption at household level generates multiplier effects in the economy as whole or when saved / transferred using financial institutions. Therefore, overseas remittances are helping East African countries to improve their macro – economic performance and the concern is on how to maximize their development impact.

While harnessing remittances for development, the issues that need to be prioritized are: making fund transfer easier and cheaper to enhance larger inflows, directing the inflows from consumption to productive investment for sustainability and effectiveness and shifting such financial inflows from informal to formal channels so as to reduce the risk of money laundering.

5.3 Recommendation

5.3.1 Policy Recommendations

Policy makers and economic planners in the East African region should design strategies that enhance remittance inflows and streamline formal fund transfer into domestic economies. This can be achieved by improving macro – economic stability particularly managing the rate of inflation and ensuring stable interest rates. When promoting formal remittance transfer, EA governments should critically look at the factors that lead to emigrants to prefer informal means of channeling funds from developed countries.

The key features which attract many remitters to choose informal channels as pointed out by the Asian Development Bank (2004), include: speed of delivery, low cost of transmission, cultural convenience, versatility and anonymity. Such features are difficult to attain when the banking network and other financial institutions' coverage do not adequately reach some sections of the society especially the rural areas. Thus, any effective strategy for attracting remittances into the formal banking system should attempt to expand the branch network so as to effectively link overseas workers with the remittance receiving families and to take on more of the desirable features of the services offered by the informal channels.

Given the large amounts of remittance inflows, efforts should be made in East Africa to selectively channel these private transfers to some sectors like agriculture through policy incentive schemes. For instance, returning emigrants should be allowed to import machinery and equipment at concessionary rates of duty for investing in manufacturing and agricultural enterprises. This innovative approach along with provision of attractive foreign exchange rates especially if financial intermediaries involved in handling remittance funds are offered tax incentives is likely to attract more inflows.

Partnerships between mobile – phone firms and financial intermediaries should be strengthened, guided and provided with incentives (for instance reduced tax rates) to develop financial products attractive to remitters. These innovative products include: expansion of mobile money transfer to include overseas remittance receipts. Financial institutions should particularly be encouraged to develop financial products like creation of migrant workers' savings and credit schemes that are managed as pension funds, real estates development on hire purchase basis and provision of credit/ loans on agreement that future repayments would be met from remittances. These types of financial products are plausible and attractive to migrant workers who often consider overseas employment as a means of saving money for undertaking investment upon return.

5.3.2 Further Research

Future research should consider establishing in detail which sub-sectors of the East African economies benefit most from remittance inflows. That is, determining the sectoral impacts (economy – wide) of remittance inflows. This will be helpful in understanding whether remittances are mostly and only used for consumption smoothing in East Africa or are invested in development activities like education for human capital development, injection in agriculture or manufacturing.

Research should also look at longitudinal household – level studies to determine the impact of remittances on the poverty levels of remittance recipient households in the East African region. Knowledge on the role of remittances on household poverty will be useful in guiding the policy formulation process on how to target remittance for poverty alleviation.

It is further recommended that empirical studies examine whether prospects for remittance transfers have resulted into increased opening up money transfer agencies or it is these agencies that have promoted more remittances transfers. This will further confirm whether remittances actually increase lending by the banking sector. Lastly but not least transactions costs in remittances transfers should be tested empirically to ascertain how much those costs hinder the inflows of these financial transfers.

REFERENCES

Adams, R and J. Page (2005), *Do International Migration and Remittances Reduce Poverty in Developing Countries?, World Development*, Vol. 33 (10): 1645-69.

Aggarwal R., Demirgüç-Kunt A., Pena Martinez S. M. (2006). *Do workers ' Remittances Promote financial development?* MCdonough School of Business, Georgtown University and the World Bank. G. 04 Old North, Washington D. C. 20057. WPS 3957.

Apaa – Okello J. and Anguyo F. (2006). *The Cyclical Implications of Immigrant Workers Remittances to Uganda*. Reaserch Department, Bank of Uganda, Kampala, Uganda.

Asian Development Bank (2004). *The Southeast Asia Workers' Remittance Study*. Technical Assistance Financed by the Japan Special Fund. TAR: STU 38233. December 2004

Athukorala, P. (1993) *Enhancing Developmental Impact of Migrant Remittances*: A review of Asian Experiences, in ILO-ARTEP (1993)

Aydas T.O., Nayapti B., and Metin – Ozcan K. (2004). *Dterminants of Workers' Remittances: The case of Turkey*. Bilket University O6800 Bilket, Ankura, Turkey.

Azam J. P. and Gubert F. (2005). *Migrant Remittances and Economic Development in Africa: A Review of Evidence.* IDEI Working Paper 354 (Toulouse: Institut d'Économie Industrielle).

Boyd, John H., Ross Levine, and Bruce D. Smith, 2001. "The Impact of Inflation on Financial Sector Performance." *Journal of Monetary Economics*, 47, 221-248.

Barro, R. (1996). 'Determinants of Economic Growth: A Cross-Country Empirical Study', *NBER Working Paper* 5698, National Bureau of Economic Research.

Barro, R. and Sala-i-Martin X. (1995), *Economic Growth*, McGraw-Hill, Cambridge, MA.

Beck, T., Demirgüç-Kunt A., and Levine R. 2003. *Law, Endowments, and Finance. Journal of Financial Economics*, 70, 137-181.

Brière *D. B.*, Sadoulet E., De Janvry A., and Lambert S. (2002). *The Roles of Destination, Gender and Household Composition in Explaining Remittances: An Analysis for the Dominican Sierra*. Journal of Development Economics, Vol. 68, 309.

Buch M. C. and Kuckulenz A. (2004). *Workers' Remittances and capital flows to Developing Countries.* Discussion Paper No. 04 -31. ZEW Zentrum fur Europa ische. Centre for European Economic Research.

Chami R., Barajas A., Cosimano T., Fullenkamp C., Gapen M., and Montiel P. (2008). *Macroeconomic Consequences of Remittances*, IMF Occassional Paper, No. 259.

Chami R., Fullenkamp C., and Jahjah S, (2005). "*Are Immigrant Remittance Flows a Source of Capital for Development?*" IMF Staff Papers, Vol 52 (April), pp. 55–81.

Chami R., Fullenkamp C. and Jahjah S. (2003), *Are Immigrant Remittance Flows a Source of Capital for Development?*, *IMF Working Paper* 01/189, International Monetary Fund, Washington DC.

Chimhowu A., Pinder C., Piesse J. (2003). *Assessing the impact of Migrant Workers' Remittances on Poverty.* Presented at New Direction in Impact Assessment for Development Methods and Practices. IDPM, University of Manchester, Kings College, London. Institute for Development Policy and Management. Wise Development LTD 24 – 25 November

Chinn, Menzie D. and Hiro Ito, 2002. *Capital Account Liberalization, Institutions and Financial Development: Cross Country Evidence*. NBER Working Paper 8967.

Connell J. and Conwey D. (2000). *Migration and Remittances in Island Microstates: A Comparative Perspective on the South Pacific and the Caribbean*. International Journal of Urban and Regional Research 24: 52-78.

Daianu, D. (2001), *Balance of Payments Financing in Romania – The Role of Remittances*, Romanian Center for Economic Policies, Bucharest.

De Luna Martinez J. (2005). *Workers' Remittances to Developing Countries*. Findings of a Survey with Central Banks on Select Public Policy Issues. World Bank. Mimeo.

Demirgüç-Kunt A., López Córdova E. , Soledad Martinez P. M., Woodroff C. (2007). *Remittances and Banking Services: Evidence from Mexico*. The World Bank, International Finance Corporation and University of California, San Diego

Durand, J., Kandel W., Parrado E., and Massey D. (1996). *Migradollars and Development: A Reconsideration of the Mexican Case.* International Migration Review **30**(2): 423-444.

Elbadawi I. and Rocha R. (1992), *Determinants of Expatriate Workers' Remittances in North Africa and Europe*, World Bank Policy Research Working Paper No.WPS1038

El Mouhoud M., Oudinet J. and Unan E. (2008). Macroeconomic *Determinants of migrants' Remittances in the Southern and Eastern Meditterranean Countries* (Second Draft). Seminaire, Demographic, employ et migration entre les Rives de la Paish Nord et GDPN, REEM - CNRS

Faini R. (2002), Development, Trade, and Migration, proceedings from the ABCDE Europe Conference, 1-2: 85-116.

Fayissa B. (2008). *The Impact of Remittances on Economic Growth and Development in Africa.* Middle Tennessee State University. Department of Economics And Finance Working Paper Series

Freund C. and Spatafora N. (2005). *Remittances: Transaction Costs, Determinants, and Informal Flows.* World Bank Policy Research Working Paper No. 3704 (Washington: World Bank).

Gulde, Anne-Marie, Catherine Pattillo, Jakob Christensen, Kevin Carey, and Smita Wagh, (2006) Sub-Saharan Africa: Financial Sector Challenges (Washington: International Monetary Fund).

Gupta S., Pattillo C., and Wagh S. (2007). *Impact of Remittances on Poverty and Financial Development in Sub Saharan Africa.* IMF Working Paper. WP/07/38.

Garcia – Fuentes P. A. and Kennedy P. L. (2009). *Remittances and Economic Growth in Latin America and the Carribean. The Impact of Human Capital Development*. Selected Paper Prepared for Presentation at the Southern Georgia, January 31 – Febraury 3, 2009. Louisina State University, 2007 Agricultural Building, Baton Rouge, LA 70803.

Giuliano P. and Ruiz-Arranz M. (2005), *Remittances, Financial Development, and Growth*, *IMF Working Paper* 05/234, International Monetary Fund, Washington DC.

Glytsos N. (1997). *Remitting Behaviour of "Temporary" and "Permanent" Migants: The Case of Greeks in Germany and Australia*. Labour 11 (3): 409-435.

Huang P. and Silva V. C. (2005). *Macroeconomic Determinants of Workers' Remittances: Host vs. Home Country's Economic Conditions.* EconPapers: International Finance, 2005 – econwpa.wustl.edu

Ilahi, N. and Jafarey S. (1999), Guestworker Migration, Remittances and the Extended Family: Evidence from Pakistan', Journal of Development Economics, Vol. 58 (2): 485-512.

International Monetary Fund, IMF (2008). *International Financial Statistics.* Vol. LXI, No. 10, October, 2008. Washington D.C. 20431, US.

International Monetary Fund, IMF (2007). *International Financial Statistics.* Vol. LX, No. 11, November 2007. Washington D.C. 20431, US.

International Monetary Fund, IMF (2005). *World Economic Outlook*, Washington, D.C.

International Monetary Fund, IMF (2003). *International Financial Statistics.* Vol. LVI, No. 12, December 2003. Washington D.C. 20431, US.

International Monetary Fund, IMF (1996). *International Financial Statistics.* Vol. XLIX, No. 8, August 1996. Washington D.C. 20431, US.

International Monetary Fund, IMF (1994). *International Financial Statistics.* Vol. XLVII, No. 4, April 1994. Washington D.C. 20431, US.

Jongwanich J. (2007). Workers' *Remittances, Economic Growth and Poverty in Developing Asia and Pacific Countries.* WP/07/01. UNESCAP Working Paper, United Nations.

Kao C. (1999). *Spurious Regression and Residual-Based Tests for co-integration in Panel Data*. Journal of Econometrics, 90: 1-44.

Karagoz (2009). *Workers' Remittances and Economci Growth: Evidence from Turkey.*

Kihangire D. and Katarikawe M. (2008). *The impact of remittances on macroeconomic stability and financial sector deepening: Opportunities and challenges for Uganda*. Bank of Uganda, Kampala.

King, R. and Levine R. 1993. *Finance and Growth: Schumpeter Might be Right. Quarterly Journal of Economics*, 108, 717-737.

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

LevineA., LinC. and Chu C. (2002). *Unit Root Tests in Panel Data: Asymptotic and Finite-sample Properties*. Journal of Econometrics, 108: 942-63.

Loser, C., Caitlin L., Adam M., and Lucia B. (2006). "The Macro – Economic Impact of Remittances in Latin America - Dutch Disease or Latin Cure?" Presented at the G-24 Technical Group meeting in Singapore on September 13-14.

Mansoor, A. M. (2007), *Migration and Remittances: Eastern Europe and the former Soviet Union*, (A. Mansoor and B. Quillin eds.) World Bank, Washington, DC.

Martin P. L. (1990). *The Unfinished Story: Turkish Labor Migration to Western Europe.* World Employment Programme Research Working Paper, ILO, Geneva.

McCormick B. and Wahba J. (2000). *Overseas Employment and Remittances to a Dual Economy*. *The Economic Journal* 110 (April): 509-534.

Mundaca G. B. (2005). *Can Remittances Enhance Economic Growth? The Role of Financial Market Development.* Mimeo. University of Oslo.

Mundaca G. B. (2009). *Remittances, Financial Markets Development and Economic Growth: the case of Latin America and Caribbean*. Review of Development Economics

Munshi, K. (2003), "Networks in the Modern Economy: Mexican Migrants in the US Labor Market", *Quarterly Journal of Economics*, No. 118, pp. 549-599.

Organization of Economic Cooperation and Development (2006). International Migrant remittances and their Role in Development. International Migration Outlook: SOPEMI 2006 Edition – ISBN 92-64-03627-X. PART III.

Orozco, M. and Fedewa R. (2006) *Leveraging Efforts of Remittances on Financial Intermediation*, INTAL Working Paper 24 , Inter-American Development Bank (http://www.iadb.org/intal).

Orozco, M. and Fedewa R. (2005). *Leveraging Efforts on Remittances and Financial Intermediation.* Report Commissioned by the Inter-American Development Bank.

Orozco, M. (2004). *The Remittance Marketplace: Prices. Policy, and Financial Institutions, Pew Hispanic Center Report*.

Puri, S. and Ritzema T. (1999), *Migrant Worker Remittances, Micro-Finance and Informal Economy: Prospects and Issues, Working Paper* No.21, Social Finance Unit, International Labour Organization.

Puri, S. and T. Ritzema (2003). Migrant Worker Remittances, Micro-finance and the informal Economy: Prospects and Issues. I.L.O. Social Finance Unit Working Paper. http://www.ilo.org/public/english/employment/ent/paper

Ratha D. (2003). *Workers' Remittances: An Important and Stable Source of External Development Finance*. Global Development Finance 2003—Striving for Stability in Development Finance, (Washington: World Bank), pp. 157–75.

Ratha D. and Mohaptra S. (2007). *Incraesing the Macrononomic impact of remittances on Development.* Development Prospect Group. The World Bank. Washington D.C. 20433

Rajan, R. and Arvind S. (2005). *What Undermines Aid's Impact onGrowth?* International Monetary Fund Working Paper 05/126.

Rocha E. and Pelleier A. (2008). *Migrant Workers' Remittances: What is the Impact on economic and Financial Development of Sub Saharan Africa?* Economic International and European Relations Directorat. Franc Zone and Development Financing Division. University of Paris IX EURISCO No.174

Sakka M. I. T. (2005). *Migrant Workers' Remittances and Macroeconomic Policy in Jordan.* Dept. of Economics: Kuwait University

Sakka M. and McNabb R. (1999). *The Macroeconomic Determinants of Emigrant Remittances. World Development,* Vol. 27, No. 8, pp. 1493-1502.

Straubhar T (1986). *The Determinants of Workers' Remittances: The Case of Turkey.* Weltwirtschafliches Archiv, 122, 728-740.

Shahbaz M. and Aamir N. (2009). *Determinants of Workers' Remittances: Implications for the poor people of Parkistan. European Journal of Scientific Research* ISSN 1450 – 2216X Vol. 25 No. 1 (2009), PP. 130 -144 Eurojournals Publishing Inc 2009.

Shabahz M., Qureshi N. M., Aamir N. (2007). *Remittances and Financial Sector Performance Under Two Alternative Approaches.* Internation Research Journal of Finance and Economics. ISSN 1450 – 2887. Issue 12 (2007). Eurojournal Publishing, Inc. 2007.

Schiopu I. and Siegfried N. (2006). *Determinants of Workers' Remittances Evidence from the European Neighbouring Region.* Paper No 688. The European Central Bank.

Solimano A. (2003). *Workers Remittances to the Andean Region: Mechanisms, Costs and Development Impact.* Paper prepared for the Multilateral Investment Fund-IDB's Conference on Remittances and Development, May 2003, Quito-Ecuador.

Schroteen M. (2005). *Bringing Money home. What Determines Workers Remittances to Transistion Countries* Hitotsubashi University. DIW Berlin. The Institute of Economic Research, Kumtachi, Tokya 186 – 8603.

Stahl C. W. and Arnold F. (1986). *Overseas Workers' Remittances in Asian Development*. International Migration Review, 20 (4): 899-925.

Taylor, J.E. (1999), "The New Economics of Labor Migration and the Role of Remittances", *International Migration*, Vol. 37(1), pp. 63-86.

Toxopeus H. S. and Lensink R. (2006). *Remittances and Financial Inclusion in Development*. draft (The Netherlands: University of Groningen).

United Nations Statistics Division Common Database, Key Global indicators (2007).

Woodruff C. and Zenteno R. (2004). *Remittances and Micro – enterprise in Mexico*. Mimeo. University of California, San Diego.

World Bank (2006). Global Economic Prospects, World Bank, Washington D.C.

World Bank (2007). *World Development Indicators*. Migration and Remittance fact book. Website: www.worldbank.org/prospects/migrationandremittances.

Yang D. (2004). *International Migration, Human Capital, and Entrepreneurship: Evidence from Philippine Migrants' Exchange Rate Shocks.* World Bank Policy Research Working Paper 3578.

Appendix A: Regression Results

OBJECTIVE 1: DETERMINANTS OF REMITTANCES IN EAST AFRICA

Prais-Winsten regression, correlated panels corrected standard errors (PCSEs)

xtpcse lnRemit lnINF lnlagRemit lnReal_Int lnReal_ext lnpercapita lnopen lnGDP_ex, correlation (psar1) rhotype freg np1 nmk

```
Group variable:   panel                          Number of obs      =        40
Time variable:    year                           Number of groups   =         3
Panels:           correlated (unbalanced)        Obs per group: min =         8
Autocorrelation:  panel-specific AR(1)                          avg =  13.33333
Sigma computed by casewise selection                            max =        20
Estimated covariances      =         6           R-squared          =    0.9079
Estimated autocorrelations =         3           Wald chi2(7)       =    126.04
Estimated coefficients     =         8           Prob > chi2        =    0.0000
```

lnRemit	Panel-corrected Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnINF	-.1349784	.1053696	-1.28	0.200	-.341499	.0715421
lnlagRemit	.316908	.1059101	2.99	0.003	.109328	.5244881
lnReal_Int	1.466586	.599159	2.45	0.014	.2922563	2.640916
lnReal_ext	-1.287426	.4442555	-2.90	0.004	-2.158151	-.4167016
lnpercapita	8.655574	1.265579	6.84	0.000	6.175084	11.13606
lnopen	-2.559929	.4322451	-5.92	0.000	-3.407114	-1.712744
lnGDP_ext	7.894761	1.253006	6.30	0.000	5.438915	10.35061
cons	-125.8082	16.6109	-7.57	0.000	-158.365	-93.25147

Rhos = .1531778 .5531975 .1688994

Prais-Winsten regression, correlated panels corrected standard errors (PCSEs)

xtpcse lnRemit lnlagRemit lnReal_int lnReal_ext lnpercapita lnopen lnGDP_ext,correlation (psar1) rhotype(freg) np1 nmk

```
Group variable:   panel                          Number of obs      =        43
Time variable:    year                           Number of groups   =         3
Panels:           correlated (unbalanced)        Obs per group: min =         9
Autocorrelation:  panel-specific AR(1)                          avg =  14.33333
Sigma computed by casewise selection                            max =        21
Estimated covariances      =         6           R-squared          =    0.9620
Estimated autocorrelations =         3           Wald chi2 (6)      =    142.37
Estimated coefficients     =         7           Prob > chi2        =    0.0000
```

lnRemit	Panel-corrected Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnlagRemit	.3696727	.0956326	3.87	0.000	.1822363	.5571092
lnReal_Int	1.429691	.4116739	3.47	0.001	.6228249	2.236557
lnReal_ext	-.8459652	.3877509	-2.18	0.029	-1.605943	-.0859874
lnpercapita	6.530718	1.071446	6.10	0.000	4.430722	8.630714
lnopen	-1.989779	.3329652	-5.98	0.000	-2.642379	-1.337179
lnGDP_ex	5.739797	1.114766	5.15	0.000	3.554896	7.924698
cons	-95.55019	14.5553	-6.56	0.000	-124.0781	-67.02233

Rhos = .3333237 .4482714 -.4071267

OBJECTIVE 2(A): IMPACT OF REMMITANCES ON ECONOMIC GROWTH

Prais-Winsten regression, correlated Panels Corrected Standard Errors (PCSEs)

xtpcse lnpercapita lnRemit_hat lnlagINF lnINV lnOpen dke dtz, correlation(psar1) rhotype (freg) np1 nmk

```
Group variable:   panel                          Number of obs      =        39
Time variable:    year                           Number of groups   =         3
Panels:           correlated (unbalanced)        Obs per group: min =         7
Autocorrelation:  panel-specific AR(1)                          avg =        13
Sigma computed by casewise selection                            max =        20
Estimated covariances      =         6           R-squared          =    0.9992
Estimated autocorrelations =         3           Wald chi2(6)       =    411.96
Estimated coefficients     =         7           Prob > chi2        =    0.0000
```

lnpercapita	Panel-corrected Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnRemit_hat	0.036408	.0127819	2.85	0.004	.0113559	.06146
lnlagINF	-.0059322	.0068605	-0.86	0.387	-.0193785	.0075141
lnINV	.101033	.0312253	3.24	0.001	.0398326	.1622333
lnOpen	.0535092	.0248248	2.16	0.031	.0048536	.1021649
dke	.2408027	.0181715	13.25	0.000	.2051873	.2764181
dtz	-.0505333	.0526217	-0.96	0.337	-.1536699	.0526034
_cons	6.368076	.09948	64.01	0.000	6.173099	6.563054

rhos = -.0598232 .5198302 .6135134

OBJECTIVE 2 (B): IMPACT OF REMMITANCES ON ECONOMIC OUTPUT

Prais-Winsten regression, correlated Panels Corrected Standard Errors (PCSEs)

xtpcse $lnGDP_i$ lnRemit_hat lnlagINF lnINV lnOpen dke dtz, correlation(psar1) rhotype(freg) np1 nmk

```
Group variable:   panel                          Number of obs      =        39
Time variable:    year                           Number of groups   =         3
Panels:           correlated (unbalanced)        Obs per group: min =         7
Autocorrelation:  panel-specific AR(1)                          avg =        13
Sigma computed by casewise selection                            max =        20
Estimated covariances      =         6           R-squared          =    0.9949
Estimated autocorrelations =         3           Wald chi2(6)       =    275.46
Estimated coefficients     =         7           Prob > chi2        =    0.0000
```

$lnGDP_i$	Panel-corrected Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnRemit_hat	0.0334598	.0126487	2.65	0.008	.0086689	.0582507
lnlagINF	-.0060738	.0065549	-0.93	0.354	-.0189213	.0067737
lnINV	.040244	.0479103	0.84	0.401	-.0536584	.1341464
lnOpen	.3287026	.0394537	8.33	0.000	.2513748	.4060304
dke	.2439368	.0377979	6.45	0.000	.1698542	.3180194
dtz	.0824652	.1256501	0.66	0.512	-.1638044	.3287348
_cons	3.948618	.1652898	23.89	0.000	3.624656	4.27258

Rhos = .2146002 .3984659 .9711538

OBJECTIVE 3 (A): IMPACT OF REMMITANCES ON FINANCIAL DEPTH

Dependent Variable: M3 as ratio of GDP

Prais-Winsten regression, correlated panels corrected standard errors (PCSEs)

xtpcse lnRM3 lnRemit_hat lnlagINF lnINV lnOpen dke dtz, correlation(psar1) rhotype(freg) np1 nmk

```
Group variable:   panel                          Number of obs      =        39
Time variable:    year                           Number of groups   =         3
Panels:           correlated (unbalanced)        Obs per group: min =         7
Autocorrelation:  panel-specific AR(1)                          avg =        13
Sigma computed by casewise selection                            max =        20
Estimated covariances      =         6           R-squared          =    0.9738
Estimated autocorrelations =         3           Wald chi2(6)       =   2228.59
Estimated coefficients     =         7           Prob > chi2        =    0.0000
```

lnrRM3	Coef.	Panel-corrected Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnRemit_hat	.0637119	.0167544	3.80	0.000	.0308739	.0965498
lnlagINF	-.00288	.0098723	-0.29	0.770	-.0222294	.0164694
lnINV	.4249999	.0673168	6.31	0.000	.2930613	.5569385
lnOpen	.4736568	.0412228	11.49	0.000	.3928616	.5544521
dke	.588038	.0361471	16.27	0.000	.5171911	.6588849
dtz	.3606724	.0643351	5.61	0.000	.234578	.4867669
_cons	1.426053	.1393873	10.23	0.000	1.152859	1.699247
rhos =	-.195162	-.0969357	-.2221935			

OBJECTIVE 3 (B): IMPACT OF REMMITANCES ON FINANCIAL DEPTH

Dependent Variable = Credit to Private Sector/GDP

With Lagged CR_PRVT

Prais-Winsten regression, correlated panels corrected standard errors (PCSEs)

xtpcse lnCR_PRVT lnlagCR_PRVT lnRemit_hat lnlagINF lnINV lnOpen dke dtz, correlation(psar1) rhotype(freg) np1 nmk

```
Group variable:   panel                          Number of obs      =        37
Time variable:    year                           Number of groups   =         3
Panels:           correlated (unbalanced)        Obs per group: min =         7
Autocorrelation:  panel-specific AR (1)                         avg =  12.33333
Sigma computed by casewise selection                            max =        19
Estimated covariances      =         6           R-squared          =    0.9749
Estimated autocorrelations =         3           Wald chi2(7)       =   1860.97
Estimated coefficients     =         8           Prob > chi2        =    0.0000
```

lnCR_PRVT	Coef.	Panel-corrected Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnlagCR_PRVT	.4025719	.1760646	2.29	0.022	.0574915	.7476522
lnRemit_hat	.1814194	.0654869	2.77	0.006	.0530673	.3097715
lnlagINF	-.0078582	.0296123	-0.27	0.791	-.0658973	.0501809
lnINV	.7713941	.1717562	4.49	0.000	.4347582	1.10803
lnOpen	.3771884	.214861	1.76	0.079	-.0439315	.7983083
dke	.9741488	.2590348	3.76	0.000	.4664499	1.481848
dtz	.6779557	.2222936	3.05	0.002	.2422683	1.113643
cons	3.42157	.9531165	3.59	0.000	1.553496	5.289644
rhos =	-.0158742	.1465004	.3482585			

Without Lagged CR_PRVT

GLS (Prais-Winsten regression), correlated Panels Corrected Standard Errors (PCSEs)

```
xtpcse lnCR_PRVT lnRemit_hat lnlagINF lnINV lnOpen dke dtz, correlation(psar1) rhotype (freg) np1 nmk
```

```
Group variable:   panel                          Number of obs      =        39
Time variable:    year                           Number of groups   =         3
Panels:           correlated (unbalanced)        Obs per group: min =         7
Autocorrelation:  panel-specific AR(1)                          avg =        13
Sigma computed by casewise selection                            max =        20
Estimated covariances      =         6           R-squared          =    0.9660
Estimated autocorrelations =         3           Wald chi2(6)       =   2506.36
Estimated coefficients     =         7           Prob > chi2        =    0.0000
```

lnCR_PRVT	Panel-corrected Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnRemit_hat	.2050621	.0503447	4.07	0.000	.1063883	.3037359
lnlagINF	-.0201697	.029392	-0.69	0.493	-.0777768	.0374375
lnINV	.7280428	.146528	4.97	0.000	.4408532	1.015232
lnOpen	.7930535	.1053593	7.53	0.000	.5865531	.9995539
dke	1.492314	.0740104	20.16	0.000	1.347256	1.637372
dtz	.6241987	.2219697	2.81	0.005	.1891462	1.059251
cons	5.13964	.3731421	13.77	0.000	4.408294	5.870985
rhos	= -.1797953	.2146224	.6490044			

Appendix B: variables and Data Sources

Variables	Construction of linearized variables	Data Sources
lnRemit	Remittances as a ratio of GDP	Remittances: WDI GDP: IFS
lnRemit_hat	Predicted variable of *lnRemit*	Remittances: WDI GDP: IFS
lnlagRemit	Lagged variable of *lnRemit*	Remittances: WDI GDP: IFS
lnPercapita	Real GDP over Population of migrant sending country	Real GDP: Key Global Indicators Population: IFS
lnOpen	Trade Openness: sum of exports and Imports as a ratio of GDP	IFS
lnINV	Gross Fixed Capital Formation as a share of GDP	IFS
lnFDI	Foreign Direct Investment (FDI) as a ratio of GDP	FDI: Key Global Indicators GDP: IFS
lnReal_Int	Domestic bank lending rates minus inflation as a percentage in Consumer Price Index (CPI)	Bank lending rates and CPI: IFS
lnGDP_ext	Weighted GDP of 5 migrant host countries	IFS
lnReal_Intext	Real interest rates in host countries minus respective inflation as percentage change in CPI	IFS
lnWage_ext	External minimum wage rates obtained as index numbers	IFS
lnCR_PRVT	Claims on private sector over GDP	IFS
lnlagCR_PRVT	Lagged variable of *lnCR_PRVT*	IFS
lnRM3	Money Supply (M3) as a ratio of GDP	IFS
lnINF	Inflation rate as a percentage change in CPI	IFS
lnlagINF	Lagged *lnINF*	IFS