The Role of International Remittance on Economic Growth in Ethiopia: An Autoregressive Distributed Lag Approach

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This is to certify that the thesis prepared by Mikias Tilahun, entitled: *The Role of International Remittance on Economic Growth in Ethiopia: An Autoregressive Distributed Lag Approach* and submitted in partial fulfillment of the requirements for the Degree of Master of Science in Economics (Economic Policy Analysis) complies with regulations of the University and meets the accepted standards with respect to originality and quality.

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ABSTRACT

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Having the general objective of investigating the role of international remittance on economic growth in Ethiopia, this study have used an auto regressive distributed lag (ARDL) model or Bound Testing approach to cointegration. The data used is from World Bank Development Indicators which spans from 1981 to 2012.

The outcome of the study revealed that, the long run growth impact of international remittance during the study period is positive and significant. However, the short run effect is found to be negative and statistically significant, showing the consumption smoothing role of remittance income in the short run. Apart from this, other growth determinant factors, such as human capital, labor force and gross fixed capital formation are found to significantly and positively affecting growth in Ethiopia. Moreover, the Granger Causality test has confirmed that there is a unidirectional causality which runs from remittance to output. The most important policy implication that comes out of this study is that the government as well as other concerned stakeholders should work on easing the remittance sending process and cost, so as to better extract the economic benefit of international remittance.

Key Words: International Remittance, Economic Growth, ARDL, Ethiopia

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List of Acronyms

ADLI	Agricultural Development Led Industrialization
ADF	Augmented Dickey Fuller
AIC	Akaike Information Criteria
ARDL	Auto Regressive Distributed Lag
CUMSUM	Cumulative Sum
CUMSUMSQ	Cumulative Sum of Squares
ECM	Error Correction Model
EPRDF	Ethiopian People's Revolutionary Democratic Front
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HICE	Household Income and Consumption Expenditure
IMF	International Monetary Fund
LAC	Latin American Countries
MENA	Middle East and North Africa
MoFED	Ministry of Finance and Economic Development
MTO	Money Transfer Operators
NBE	National Bank of Ethiopia
NELM	New Economics of Labor Migration
ODA	Official Development Assistance

OLS	Ordinary Least Square
PP	Philips and Peron
RESET	Regression Equation Specification Error Test
RGDP	Real Gross Domestic Product
RSPs	Remittance Service Providers
SSA	Sub Saharan Africa
SWIFT	Society for Worldwide Interbank Financial Telecommunication
TFP	Total Factor Productivity
UN	United Nations
UNDP	United Nations Development Program
UNECA	United Nations Economic Commission for Africa
USD	United States Dollar
VAR	Vector Auto Regressive
WB	World Bank
WDI	World Development Indicators

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Workers' remittance[1] has become an important discussion topic in the world agenda. This is due to the fact that this monetary flow has increased considerably in recent year which is coupled with the increasing migration of people from developing countries to developed ones. Although it is difficult to calculate the number of migrants worldwide with precision, recent estimations by United Nations global migration statistics reveal that by 2013 nearly 232 million people, or 3.2 per cent of the world's population, are international migrants compared to 175 million and 154 million by 2000 and 1990, respectively.[2]

In relation to the level of migration, amount of international remittance flow is becoming enormous. For many developing economies, international remittances constitute the single largest source of foreign exchange, exceeding export revenues, foreign direct investment (FDI), and other private capital inflows (Giuliano and Ruiz-Arranz, 2005; Getachew, 2009; World Bank, 2013). During the most recent ten-year period, for

[1] Workers' remittance, in broader sense, is defined in the IMF Balance of Payments Yearbooks as "goods or financial instruments transferred by migrants living and working in new economies to residents of the economies in which the migrants formerly resided". It further states that workers' remittance are "transfers made by migrants who are employed by entities of economies in which the workers are considered residents" and such transfers are usually money sent to country of origin by workers residing abroad for more than one year.

[2] Source: http://esa.un.org/unmigration/wallchart2013.htm

instance, remittance flows amounted on average about one third of export earnings, more than twice of private capital flows, almost ten times official capital flows, and more than twelve times official transfers (Barajas *et al.*, 2009).

Apart from its magnitude, the international flow of remittance is growing at a faster rate from time to time. Over the past 15 years, the flow of remittances to developing economies has grown six fold, from $56 billion in 1995 to $334 billion in 2010 (WB, 2011b). World Bank (2013a) reveals that, officially recorded remittance which is channeled to developing countries reached an estimated $401 billion in 2012, growing by 5.3 percent compared to 2011. This figure is expected to reach about $515 billion by 2015 with an average annual growth rate of 8.8 percent during 2013-2015 (WB, 2013). Remittances have even recently have grown faster than FDI and official development assistance (ODA) for many developing countries (WB, 2006).

It can also be noted that poorer countries receive relatively larger remittances, as the lower the average income of the country, the more likely that its citizens will seek to migrate and therefore the higher its remittance inflows will be. As of 2010, low income countries received $194 billion in remittances which is equivalent to 58 percent of total remittances received by all developing countries in that year (WB, 2011b). The true size, including unrecorded flows through formal and informal channels, is however believed to be significantly larger.

International migration in the Ethiopian context had shown dramatic increase starting from the late 1970's, which was the result of the political instability and revolution at that time (Alemayehu *et al.*, 2011; Dejene, 2005). Gradually, out migration which was pre-

dominated by the urban elite for political reason in the previous periods, started to take economic dimension and became the aspiration of most urban people (Alemayehu *et al.,* 2011). Dejene (2005) states that by the mid 1980s, even the rural people started migrating to the Middle East and the Gulf countries in search of jobs.

One of the major insights in relation to international migration in the Ethiopian context is the increasing amount of remittance sent to country of origin. World Migration Fact book (2011a) puts Ethiopia 8th among the top remittance receiving countries in SSA. According to the data from National Bank of Ethiopia, the amount of remittance inflow recorded in 1996/97 was around 855 million Birr. This figure increased to 9.3 billion Birr in 2006/07 fiscal year. Recently, private individual transfers, according to the same source, have grown tenfold from USD 177 million in 2000/01 to USD 1.8 billion in 2008/09 (Emerta *et al*., 2010). This dramatic increase has arisen for the most part due to the increasing stock of Ethiopian migrants across the globe.

This figure, however, only shows the remittance channeled through the official transfer. There is unofficial transfer that may increase the figure by more than double. For instance, according to Emerta *et al.* (2010), of USD 1.8 billion received from private individuals living in the rest of the world in 2008/09, only 54% is channeled through formal way, while the remaining was directed through informal channel. Similarly, the estimates of World Bank and the IMF indicates that, if remittances sent through informal channels are included, total remittances could be as much as 50 percent higher than the official record (World Bank, 2010a; IMF, 2009).

1.2. Statement of the Problem

For more than half a century, there have been heated debates on the sources of economic growth of developing economies in empirical macroeconomics. In those growth debates the perceived sources of economic growth have ranged from surplus labor to physical capital investment and technological change, foreign aid, foreign direct investment, investment in human capital, and research and development (Fayissa and Nsiah, 2008; 2010). Other researchers have also focused on the impact of institutional factors like the role of political freedom, political instability, voice and accountability on economic growth and development (Fayissa and Nsiah, 2008). While the above listed conventional sources of economic growth have received considerable attention in the empirical literature of economic growth, the macroeconomic impact of remittances on economic growth has not been adequately investigated, despite the significant inflow of international remittance to developing countries in general and Ethiopia in particular.

The lack of such a study is even annoying as remittances represent a major part of international capital flows, surpassing FDI, export revenues, and foreign aid in many developing countries (Giuliano and Ruiz-Arranz, 2005). In 2009, in some countries remittances have become as large as FDI, and in a large group of developing countries remittances represent a resource inflow that often exceeds a variety of other balance of payments flows (IMF 2009). In addition to this, the need to study the role of remittance on economic growth also emanates from the presence of an unambiguous and plentiful evidence that remittance flows to developing countries have proved to be resilient during the recent global financial crisis and increase at the time of economic downturns, natural

disasters and civil wars, unlike other capital flow alternatives (World Bank 2006; Yang, 2008). For instance, international remittance flow to developing countries fell only 5.5 percent in 2009 from its 2008 peak of $324 billion and registered a quick recovery in 2010. By contrast, there was a decline of 40 percent in FDI flows between 2008 and 2009, and a 80 percent decline in private debt and portfolio equity flows in 2009 (World Bank, 2011b; Mohapatra *et al*. 2010).

Based on the long run motivation for attracting increased remittance inflows, that is to promote economic growth and development in recipient countries, understanding of the appropriate channels through which remittances influence growth is vital in formulating sound policies to maximize its overall impact on the economy. Both theoretical foundation and empirical literature on how remittances impact economic growth of recipient countries are, however, inconclusive. Some researchers believe that migrant remittances have positive growth effects while others emphasize the negative growth effect of remittances. But all these conflicting empirical evidences on the relationship are informed by the available theoretical literature explaining on the channels through which remittances impact economic growth.

Available theoretical literature on the growth effects of remittances can be categorized into two main schools of thought; namely "*migration optimists*" and "*migration pessimists*". According to migration optimists, there are positive indirect growth effects of remittances, through economic channels such as increased saving, investment in physical and human capital (such as education and health), technological progress (Ahortor and Adenutsi, 2008), creation of extra employment, ease of domestic credit

constraint (Giuliano and Ruiz-Arranz, 2005), and the overall multiplier effects of consumption on aggregate demand and output (Adenutsi, 2010; Balde, 2010; Stahl and Arnold, 1986).

Migration pessimists, on the other hand, argue that remittances have either negative or no impact (IMF, 2005) on economic growth, as remittance flow can cause adverse behavioral changes at the household level that may lower their developmental impact (Sami and Mohammed, 2012). Their rationale is that remittances are mostly used for status-oriented, consumption and economically unproductive savings and investment instead of productive investments as argued by migration optimists (de Haas, 2007; Chami *et al*., 2005). They further argue that remittances are received by households who have high marginal propensity to consume and create moral hazard problem. This reduces labor supply, lead to reduced human capital investment as well as negatively affect economic growth through inflationary and exchange rate pressure.

Thus, although it is difficult to come up with conclusive result regarding the effect of remittance on economic growth as the above paragraphs confirm, this study improves the works of the earlier studies by trying to give answer to the issue of how remittances affect growth in the case of Ethiopia.

In order to test the existence of long run relationship between the dependent variable (economic growth) and the set of regressors, the study had employed the recently adopted Autoregressive Distributed Lag Model or the Bound Testing Approach which is based on the works of Pesaran *et al* (2001). The advantages of this method over the other estimation techniques such as Engle & Granger (1987) and Johansson (1991 and 1995) is

that both estimation procedures are based on the assumption that the underlying regressors are integrated of order one. The method, in which this paper uses, however, is applicable even when it is not known with certainty that whether the regressors are trend or first difference stationary and it does not require the variables to be integrated of the same order. This procedure also allows addressing the possible endogeneity problem that exists in empirical studies (Narayan and Smyth, 2006; as cited in Tsadkan, 2013).

Research questions

Research questions of this study are:

i. What is the structure and trend of remittance flow in Ethiopia?
ii. Does remittance spur economic growth in Ethiopia?
iii. What is the direction of causality between remittance and economic growth in Ethiopia?

1.3. Objectives of the Study

The general objective of this study is to examine the role of remittance on economic growth in Ethiopia using the data for the period 1981 to 2012. More specifically, the study aims at achieving the following objectives.

i. To assess whether remittance significantly affects economic growth in Ethiopia;
ii. To investigate the long run relationship between remittances and economic growth during the study period; and
iii. To identify whether a causal relationship between remittance and economic growth exists or not in Ethiopia. If exits, to investigate the direction of causality.

1.4. Significance of the Study

The link between workers remittance and economic growth is one of the most debatable issues in modern academic scenario. Some argue in favor of it while others are against it. The inconclusive theoretical foundation along with the diverse empirical findings so far has put policy makers in a dilemma in explaining which way the relationship is working and through which channels.

Thus, the researcher believes that this study will contribute in clarifying the role of remittance on economic growth in the case of Ethiopia and the existing literature on the area. Besides, the outcome of the study is expected to help policy makers, as an input, in decision making with regard to devising policies about inflow of workers remittance. The last but not the least importance of this study is that it will pave the way for other researchers to advance their study on the issue.

1.5. Limitation of the Study

The major limitation of the study arises from the absence of accurate data regarding remittance inflow. This is due to failure of applying the standard definition of remittance provided by IMF balance of payment statistics. Most central banks use remittance data reported by commercial banks, but leave out flows through money transfer operators and informal channels. This in turn creates a huge underestimation of remittance inflow and hence data available.

The other most frustrating challenge for this work is that there is huge inconsistency of data from different organizations such as NBE-which is in most cases similar to MoFED,

WB and IMF. Of course, huge informal flows of remittances which are not recorded by official authorities have made data inconsistency a more general problem. In order to avoid such inconsistency, attempt is made to stick to the same sources for the same group of data as much as possible.

1.6. Organization of the Paper

The rest of the paper is organized as follows. Chapter two gives a brief review both on the theoretical and empirical literatures in line with remittance and its impact on economic growth. Subsequently the third chapter explains model specification, the data type used and source along with methodology adopted. Chapter four deals with the overview of the Ethiopian economy in general and remittance related issues in particular. The econometric analysis is discussed in chapter five. The last chapter deals with conclusions and policy implications based on findings obtained from the analysis.

CHAPTER TWO

LITERATURE REVIEW

2.1. Theoretical Review

2.1.1. Conceptual Definition

Migrant remittances are broadly defined as the monetary transfers that a migrant makes to the country of origin, i.e., financial flows associated with migration (Getachew, 2009; Barai, 2012). Migration Policy Institute (2003), Adams and Page (2003) and Harrison (2003) as cited in Alemayehu *et al*., (2011) treat remittances as transactions that are initiated by individuals living or working outside their country of birth or origin and related to their migration. Based on the IMF's balance of payments manual (1993) and World Bank (2008), there are three components generally mentioned as constituting remittances, namely *compensation of employees* (part of the income component of the current account), *worker's remittances* (part of current transfers in the current account) and *migrants' transfer* (part of the capital account).

Workers' remittances are current private transfers from migrant workers who are considered resident of the host country to recipients in their country of origin. If the migrants live in the host country for a year or longer, they are considered residents, regardless of their immigration status (Alemayehu *et al.*, 2011). If the migrants have lived in the host country for less than a year, their entire income in the host country should be classified as compensation of employees. Migrants' transfers include financial items that

arise from the migration (change of residence) of individuals from one economy to another (Edwards, 2010; Barajas *et al.*, 2009).

2.1.2. Theories of Remittance

The outflow of human capital resources from developing to developed countries appear to be somehow beneficial to the world economy today. This is due to the fact that developing countries are earning substantial amount of foreign exchange through migrant remittances whereas the advanced and semi-industrialized are enjoying higher surplus value as a result of employing cheap labor from these developing countries.

Conceptually, two main schools of thought can be identified with regard to the broad impact of foreign remittances on developing economies. These are remittance-optimistic developmental and the remittance-pessimistic migrant syndrome schools of thought (Ahortor and Adenutsi, 2010). The ideology of remittance-optimistic developmentalist school is that international remittances have the potential of enhancing the development process via positively contributing to the elimination of production and investment constraints through direct financing of critical developmental projects, raising the average household incomes, lessening balance of payment problems, facilitating debt servicing and narrowing the trade gap of developing countries. From the developed nations' point of view, the emergence of remittances on the global scale has further encouraged international migration to advanced countries resulting in increasing large scale production due to cheap labor from developing economies. This reduces average cost of production in industrialized countries.

On the other hand, the main argument of remittance pessimistic school is that the quest for international remittances leads to international migration which drains native developing countries of highly trained and skilled labor and capital by crowding out domestic production of tradable goods in the brain-drained underdeveloped economy. This implies that that the one who gains from international remittance is developed nations via cheap labor, high taxation on migrant earnings, and to some extent, from commissions paid by migrants when transferring remittances to their native countries. Accordingly, the low wages paid to migrants in advanced economies is not sufficient enough to benefit developing countries substantially in narrowing the developmental gap between advanced and developing nations. For remittance-pessimistic school, international remittance deepens foreign dependent mentality, may promote higher inequality among households and creates macroeconomic instability in the form of inflation through excess demand for consumables relative to deficit in domestic production capacity of developing countries.

2.1.3. Determinants of Remittance

Understanding the underlying motivations behind remitting is necessary for investigating the economic impact of remittances, for at least two reasons. First, the amount a migrant remits depends on the migrant's underlying reasons to migrate and to remit in the first place. In turn, the size and timing of the remittance flows determine their impact on economic activity in the home country. Second, the intended purposes of remittances through the uses to which recipients put remittances are an important determinant of their economic impact on the home country (Chami *et al.*, 2008).

Based on the findings of both theoretical and empirical studies, this section is divided into two parts: (1) microeconomic determinants related to circumstances of migration and the migrant's connection with the home setting, and (2) macroeconomic determinants related to economic conditions and policies both in the home and host country.

i. Microeconomic Determinants

Lucas and Stark (1985) have indentified three different types of motivation behind sending of remittances: *pure altruism*, *pure self-interest*, and *tempered altruism or enlightened self-interest*. In the case of pure altruism, migrants send remittances simply because they care about the well-being of those left behind. Migrant derives positive utility not only from his/her own consumption but also from the consumption of family members at home. This implies that there is a positive relation between adverse conditions of the family left behind and the amount of remittances sent by the migrant.

Remittances may also be motivated by self-interested reasons where the family is considered as a business that enters into Pareto-improving exchanges (Chami *et al.*, 2005). One case is where remitter buys various types of services such as taking care of the migrant's assets (land, cattle) or relatives at home that the family members are used as their trustworthy and well-informed agents (Lucas and Stark, 1985). Another way to think is to consider the case where a migrant remits to demonstrate laudable behavior as an investment for the future or with the hope to inherit either family or community asset.

Tempered altruism or enlightened self-interest explains how the migrant and the household left behind mutually benefit from migration through informal contractual

arrangements. The New Economics of Labor Migration (NELM) hypothesize that due to market failures in the home country; a household member migrates and enters a coinsurance agreement with the household left behind (Taylor, 1999). The migrant will send remittances home when the household experiences shocks or economic downturns and at the same time the household supports the migrant by paying the costs of migration.

The same rationale may be used to explain remittances as repayments of loans on investments in education. In this case, the implicit contractual arrangement aims at increasing family income where the family will keep on sending migrants as long as family income is thereby increased. The family invests in the education of the migrant and usually finances the costs of migrating. The repayment of the loan back to the family in the form of remittances comes after the migrant settles in the foreign country and his earnings profile starts rising over (Rapoport and Docquier, 2005).

ii. Macroeconomic Determinants

Apart from the microeconomic motives of sending remittance, there are also other factors that determine the volume of remittance flow at macroeconomic level. Most empirical papers focus on the number of migrant workers, the economic situation in the host and home country, inflation, the relative interest rate between the sending and receiving country, and government policies and political stability in the receiving country as determinants of remittance flows.

The stock of migrant workers in the host country is an obvious determinant of remittances (World Bank, 2008) because the greater the stock of workers, the greater the

volume of remittances. According to Swamy (1981) as cited in Alemayehu *et al*., (2011), the level of economic activity in the home country is important because negative shocks in the home country may increase the need for remittances to be sent, which may induce current migrants to increase the level of remittances or cause migration in the first place. On the other hand, the economic situation in the host country is important because better economic conditions allow migrants to increase their employment and earnings prospects, which gives them the opportunity to remit more (IMF, 2005).

Remittances are perceived to be responsive to changes in the interest rate differential between the home and host country. Apparently, Elbadawi & Rocha (1992) have found that remittances respond positively to interest rate differentials, as greater potential return to assets in the home country encourage migrants to invest in the home country and therefore stimulate remittances.

Absence of good economic policies and institutions in the home country, like black market premiums and exchange rate restrictions, may discourage remittances and shift remittances from the formal to the informal sector (IMF, 2005). The views on the role of domestic inflation have been mixed. El-Sakka and Mcnabb (1999) hold that inflation has a positive relationship with the size of remittance inflow as migrants raise the amount they send in response to inflation in the home country to maintain the consumption of families back home. Elbadawi and Rocha (1992), however, argue that high rate of inflation is a sign of economic instability and, thus, may discourage remittances. On the other hand, greater financial sector development may encourage remittances by making remittances easier and cheaper to send and receive.

Political instability and low levels of law and order may also discourage migrants from sending remittances due to the risk of expropriation or theft. Likewise, an unstable political and macroeconomic environment is not conducive for investment purposes and may therefore deter remittances. On the contrary, an unstable environment may create an incentive to migrate and in such times there may also be more need for remittances.

2.2. Remittance-Growth Linkage: an Empirical Review

It is argued that remittance propels economic growth through different channels. Firstly, remittance increases investment in physical capital and domestic investment rate. In relation to investment decision, remittances increase the macroeconomic stability of domestic economy; hence tend to lower risk premium demanded by the firms to undertake investment, which makes the domestic investment more attractive (Abdullaev, 2011).

The empirical work of World Bank (2006) conducted on a panel data by applying System GMM using a sample of 67 countries with a data set over the period of 1991 – 2005 has found a positive and significant relationship between remittances to GDP ratio and per capita GDP growth. The study further concluded that one of the main channels through which remittances work is through increasing domestic investment.

Yasmeen *et al.*, (2011) used the annual time series data of period from 1984 to 2009 of Pakistan to empirically identify the impact of workers' remittances on private investment and total consumption. The result suggested that workers' remittances have significant

and indirect positive impact on total consumption and private investment, which in turn have positive impact on economic growth.

Remittance also has a role of stabilizing macro economy. In this regard, Ratha and Mohapatra (2007) state that when a recipient country experiences economic downturn because of a financial crisis, natural disaster or political conflict, remittances tend to rise and stabilize the macro economy which in turn have a positive role on investment decision. Similarly, Chami *et al.,* (2009) as cited in Barajas *et al*., (2009), by using a large sample of remittance receiving countries have showed that remittances reduce output volatility.

In relation to the investment decision, family members of remittance receiving household possess some informational advantage or expertise with respect to formal financial intermediaries. This informational advantage and know-how how to use the remittance income gives remittance earners to make calculated investment decisions which is believed to improve factor productivity of the remittance receiving households that foster growth.

Empirically, Diaz (undated) have used data for a sample of 73 countries over the years 1975-2002 and applied Path analysis to identify the effect of remittances on economic growth. The result of the study shows that there is positive and significant effect of remittances on growth but indirectly through investment. She concluded that investment plays an important role in mediating between remittance and economic growth.

Secondly, remittance affects economic growth through labor force participation and investment on human capital. Concerning the labor force participation, remittances are expected to have negative impact on economic growth. This is because individuals, particularly remittance earners, start to substitute unearned remittance for labor income and choose to work less. Besides, regardless of their intended use, remittance transfers may be plagued by severe moral hazard problems, since these flows occur under asymmetric information and in the context in which monitoring and enforcement are made extremely difficult by the distance separating remitter and recipient. According to Barajas *et al.,* (2009) the moral hazard problem may induce recipients to divert resources to the consumption of leisure, thereby reducing their labor market effort.

A study by Itzigsohn (1995) in the case of households in the capital cities of four Caribbean Basin countries namely Haiti, Jamaica, Guatemala and Dominican Republic, found that remittance inflows have a significant positive effect on nonparticipation of the head of the family as well as other members of remittance receiving families in three capital cities. Similarly, Kozelt and Alderman (1990) studied labor force participation and labor supply in Pakistan using data from the 1986 survey and came up with a significant negative impact of remittance on the labor force participation of males. Ahorter and Adenutsi (2009) also concluded that workers' remittances may create voluntary unemployment in recipient countries because of over dependency on external or workers' remittances income. The works of Acosta *et al.,* (2006), have revealed the negative impact of remittances on the labor supply in the case of El Salvador and Mexico.

On the other hand, it is argued that a substantial portion of remittance income is allocated to human capital formation in the form of better nutrition, schooling and health. This implies that remittance income have a role in preventing young members of the family not to abandon school and join to labor market in search of jobs (Gupta et al. 2009). This can be observed from two dimensions: decreasing labor force participation on one hand and increasing investment in human capital on the other. As explained earlier, the first facet have negative impact on economic growth as less labor force participation leads to less output. But, the second aspect enhances economic growth as high investment on human capital leads to higher productivity and hence higher output.

Cox-Edwards and Ureta (2003) by using the sample of more than 8000 families in El Salvador found that remittances play a significant role in keeping younger members of the family at schools and hence financing human capital. Likewise, Udah (2011) based on his study in Nigeria showed that remittances affect economic performance in Nigeria through its interaction with human capital and technology diffusion (Ukeje and Obiechina, 2013). Calero (2008) also explored that remittances increases school enrollment and decrease the extent of child work. The study had revealed that remittances are used to finance education when households are facing aggregate shocks as these shocks are associated with increased work activities. Similarly, Yang (2004) on his study conducted in Philippines indicated that increased household's remittances enhances human capital accumulation by more children schooling, reduced child labor and increased expenditure on education in origin of households.

There are also other studies which found a positive association between remittances and education. For instance, Hanson and Woodruff (2003) confirmed that children at Mexican households who have migrants completed more years of schooling than children without migrant household. They argue that this is related to migrant remittances which relax credit constraints and increase the educational attainment of children. Moreover, the study by Lopez-Cordova (2006) revealed that an increase in the fraction of Mexican households receiving remittances has a significant effect in reducing illiteracy in children six to fourteen years of age and in improving school attendance in children with five-years of age. Abdullaev (2011), based on his study on the impact of remittance on economic growth in selected Asian and former Soviet Union countries found that remittances have positive impact on economic growth through human capital accumulation. Accordingly, doubling the remittance income leads to an approximately five percent increase in human capital accumulation.

Along with remittance income and educational attainment, remittance can also help boost human capital in recipient countries through financing the health care of recipients. When remittances are used to finance health care in recipient countries, this can have positive impacts on human capital development which in the long run leads to positive economic growth. It is, however, important to determine whether the greater share of remitted income is used for education and health care, in which many studies are not capable of revealing this fact.

Thirdly, remittance incomes have a positive impact on growth through its effect on the recipient economy's financial system or flow of fund through the banking sector. By

directly financing an increase in capital accumulation and by increasing the recipient country's demand for money, remittance is likely to expand the supply of funds to the banking system (Barajas *et al.*, 2009). This in turn leads to enhanced financial development and to higher economic growth either through economies of scale effect on financial intermediation or through a political economy effect[3] or both (Neupane, 2011 as cited in Parajuli, (undated)).

In other words, remittances provide the catalyst for financial market and monetary policy development in developing countries. Various studies such as Guilano and Arranz (2005), Woodruff and Zenteno (2004), and Fajnzylber and Lopez (2007), found that remittances improve and alleviate credit constraints on the poor, improve the allocation of capital, substitute for the lack of financial development and thus accelerate economic growth. Besides, empirical works of Aggarwal *et al.*, (2006) using panel estimations over 99 developing countries for the 1975–2003 period, confirm that remittances are found to be associated with higher ratios of both banking deposits and credit to GDP ratio. Nevertheless, Barajas *et al.* (2009) pointed out that the more highly integrated an economy is with world financial markets, and the more highly developed the domestic financial system, the less likely it is that remittance receipts will stimulate investment by relaxing credit constraints.

Faini (2002, 2006) and Ang (2007) also exposed the positive impact of remittances on growth. According to Faini (2002), remittances positively affect economic growth through overcoming capital market imperfections and allowing migrant households to

[3] By political economy effect it refers to a situation where larger constituencies of depositors are able to pressure the government into undertaking beneficial financial reform.

accumulate positive assets. By applying OLS to regress the average annual per capita GDP growth rate with corresponding total remittance to GDP ratio for 68 countries during 1980 to 2004, Faini (2006) found the coefficients to be positive and significant in which he concluded that remittance definitely promotes growth.

Fayissa and Nsiah (2010) studied whether remittances can spur economic growth and development in 18 Latin American countries within the conventional neoclassical growth framework using an unbalanced panel data spanning from 1980 to 2005. Their result established that remittances have a positive and significant effect on the growth of Latin American Countries (LAC) where the financial systems are less developed by providing an alternative way to finance investment and helping overcome liquidity constraints. To be specific, they found that a 10 percent increase in remittances lead to a 0.15 percent increase in GDP per capita income.

Another way through which remittances affect economic growth is via its effect on consumption and saving-investment decision. But this role depends on among other things; the type of consumption in which the remittance is spent on, the proportion of remittance that is meant for saving and the type of investment decision undertaken by the remittance income.

A study by Chami *et al.*, (2003) found that migrants' remittances have negative impact on growth in per capita incomes. The justification is attributed to three stylized facts: first, a "significant proportion, and often the majority," of remittances are spent on consumption; second, a smaller part of remittance funds goes into saving or investment; and third, the

ways in which remittances are typically saved or invested - in housing, land and jewelry - are "not necessarily productive" to the economy as a whole (Ukeje and Obiechina, 2013).

Various studies also strength the argument mentioned above. For instance, a study by Gilani *et al.,* (1981) found that most of the remittance in Pakistan was spent on consumption followed by residential investment. About 60 to 80 percent of the remittance in Latin American countries is used for consumption purpose only (World Bank, 2006). Moreover, a significant portion of remittance in Egypt (Adams, 1991), Pakistan (Alderman, 1996; Adams, 1998) and Western Samoa and Tonga (Brown, 1994) is spent for land and house purchase, which are unproductive. Similarly, Ahlburg (1991), and Brown and Ahlburg (1999) have argued that remittances undermine productivity and growth in low income countries because they are readily spent on consumption likely to be dominated by foreign good than on productive investments.

Unlike the finding of Chami *et al.*, (2003), Ziesemer (2007) by applying Generalized Method of Moments (GMM) methodology for pooled data set proposes a savings channel that relates remittances with growth. He found that remittances have a positive impact on growth, through the ability to increase saving rates in countries with a per capita income of less than US $1200. Likewise, Banain and Roberts (2006) as cited in Parajuli, (undated) argued that there is a high propensity to save out of remittance and thus impact of remittance on growth could be positive.

Remittances can foster economic growth by smoothing consumption in the situations where there are macroeconomic shocks. Bugamelli and Paterno (2008), based on their empirical work, provide evidence of a negative association between remittances and

output growth volatility. The study further indicated that, increased consumption and even "unproductive" investments (such as real estate) can have significant multiplier effects, encouraging more capital accumulation and growth through spillover effects. Studies by Ratha, (2003); Gupta *et al.*, (2009); Ali and Alpaslan (2013) concluded that remittances raise the consumption capacity of rural households which might have substantial multiplier effects because they are more likely to be spent on domestically produced goods.

Fifthly, remittances affect economic growth through its effect on current account balance or as a means of foreign exchange earnings (Das and Serieux, 2010). In developing countries where foreign exchange is in short, remittances can be used to build foreign exchange and finance the current account deficit. For instance, according to Sufian (2009) remittances are beneficial to the recipient country as they increase country's creditworthiness and enhance their access to international capital markets. He showed that in the case of MENA countries, indebtedness ratio (ratio of debt to export of goods and services) would be significantly lower if remittances were included in the estimation equation (Abdullaev, 2011). Moreover, World Bank, (2011b) indicated that the current account deficit as a percentage of GDP of low income countries would have more than doubled in the absence of remittances in recent years. For some large remittance recipient countries such as the Philippines, Bangladesh and Nepal, remittance flows have offset large trade deficits and enabled these countries to maintain a current account surplus (Mohapatra *et al*., 2010).

Apart from the positive role of remittance flow in maintaining current account surplus, there are also other ways where remittances could hamper economic growth. For instance, in countries where there is huge inflow of remittance and poor macroeconomic management, this huge inflow could lead to appreciation of domestic currency due to increasing price of exportable commodities which results in '*dutch disease'* effect. This is in turn is harmful for long run economic growth as the domestic economy may completely lose its competitiveness in international economy.

Amuedo-Dorantes and Pozo (2004) found that remittances caused sizable real exchange rate appreciation in Latin American and 109 developing countries over 1990–2003. Similarly, by employing an unbalanced panel data set comprising 109 developing and transition countries for the period 1990-2003, Emmanuel *et al* (2010) found *dutch disease* effect of rising levels of remittances in these emerging economies. The works of Rajan and Subramanian (2005), Lopez and Molina (2006), and Lartey and Mandelman (2007) as cited in Acosta *et al.* (2006), document the real exchange rate appreciation following flows of remittance by using cross-country data set. In relation to this, Rodrik (2007) provided evidence that real exchange rate overvaluation undermines long-term economic growth as the production of tradable goods suffers disproportionately from weak institutions and market failures, particularly for developing countries.

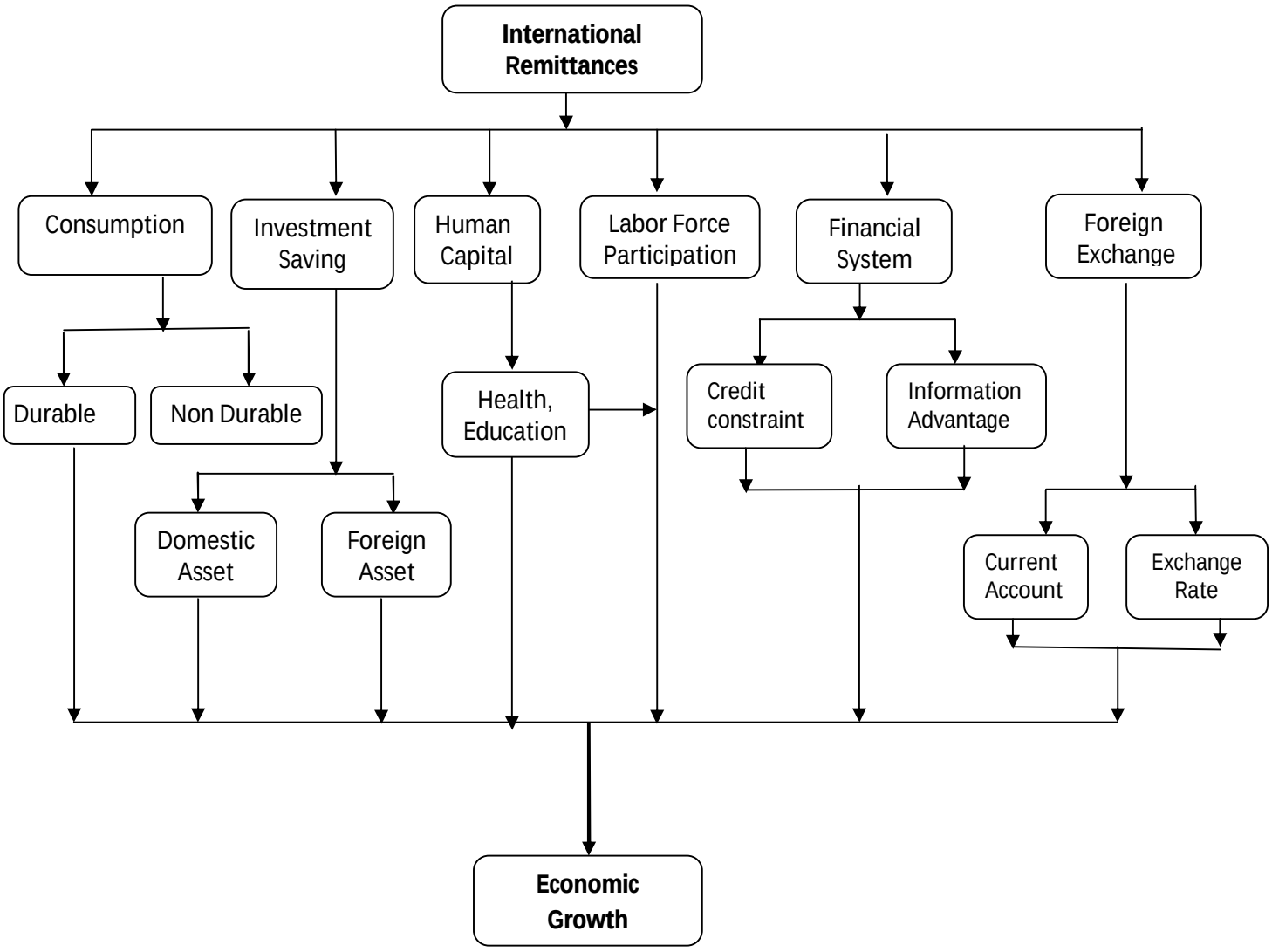
There are various empirical studies which came up with inconclusive results either in sign of relationship between remittance and growth or in significance. For instance, a study by Jawaid and Raza (2012) which investigated the relationship between remittance and economic growth in China and Korea using time series data from 1980 to 2009 and

cointegration methodology confirmed that there exists significant long run relationship between remittances and economic growth in Korea, while significant negative relationship exists in case of China. The Error correction model showed that there is significant positive short run relationship of workers' remittances with economic growth in Korea while the result in China is insignificant.

According to a study conducted by IMF (2005) on the impact of remittances on growth over an extended period (1970-2003) for 101 developing countries, it is found that there is no statistical link between remittances and per capita output growth, or between remittances and other variables such as education or investment rates. However, this inconclusive result attributed to measurement difficulties arising from the fact that remittances may behave countercyclical with respect to growth

In conclusion, the overall discussion made so far shows that there are many potential effects of remittances on economic growth via various channels, though these effects are of highly uncertain in magnitude and conflicting in direction. The main implication that emerges from this is that the effects of remittance inflows on the economic growth of the recipient economy are theoretically ambiguous, and the issue is therefore an empirical one. The following figure tries to summarize the link (channels) through which remittances can affect economic growth.

Figure 2.1. Channels in which Remittance affect Economic Growth



Source: Based on the works of Qayyum *et al*., (2008) and modified for the context

CHAPTER THREE

DATA AND METHODOLOGY

3.1. Model Specification

After reviewing the theoretical and empirical work, the model to examine the impact of workers' remittances on economic growth is derived using the production function framework. Putting the production function in general form as follows:

$$Y = f(A, L, K)$$

Where Y is the real gross domestic product, L is the total labor force and K is the capital stock. The variable A captures the total factor productivity (TFP) effect on the growth in output not accounted for by increasing in factor inputs (L and K). According to the new (endogenous) growth theory, A is endogenously determined by economic factors and can be specified using observable factors.

Several studies have argued that the growth rate of total factor productivity is a function of the quality of available human capital. This takes us to the argument of simple neoclassical growth model based on the endogenous growth theory that supports modeling the growth of total factor productivity as being affected by human capital formation. Among the attributors of endogenous growth model, Romer (1990), for instance, models the growth of total factor productivity as being affected by the skilled content of human capital employed in the research sector, and finds that the stock of human capital in an economy is a determinant of the rate of growth. Nelson and Phelps

(1966) argued that education which is used as a proxy for human capital contributes to the adoption and implementation of new technologies.

Nelson and Phelps (1966) further argued that including education (human capital) as an additional input in an aggregate production function so as to represent the relationship between education and aggregate output may be a gross misspecification. They rather argue that education promotes adoption and implementation of new technologies and hence model the growth of technology as being affected by human capital. Benhabib and Spiegel (1994) as cited in Garcia-Fuentes and Kennedy (2009), model TFP growth as a function of human capital itself and its interaction in a catch-up setting. They suggest that the growth rates may differ among countries because of differences in human capital stock levels. Thus, human capital enhances economic growth by affecting the growth of TFP both directly and through its interactions.

Taking education as a proxy and of course as the most important determinant of human capital has an implication in indicating the channels through which it affects growth. Education increases knowledge (TFP) which helps to produce more output in relatively smaller time. It is intuitive that an educated person could learn much faster. Increase in the level of education also leads towards better health due to increase in the awareness of the benefits of healthy living, which in turn increases output. Moreover, education also enhances labor force participation in an economy particularly in the case of female participation and output increases further, due to the higher labor force participation rate.

The impact of remittances on economic growth can also be formulated within the endogenous growth model setup. If remittance is spent on investment, particularly on

human capital investment, endogenous growth model provide the channel through which remittances could promote economic growth. The argument is that whenever families who earn remittance income spend on education, it accelerates the pace of economic growth through enhancing human capital and hence productivity. In fact, the World Bank recent survey shows that 29% of remittance income is spent on education and this strengthen my proposed channel here. In addition since about 60% of the remittance, according to this World Bank study, is also spend on daily expenses which might be considered as consumption, it is reasonable that this contributes to the well being/ health of the individual. Moreover, as a positive externality remittance receiving families has informational advantage than non remittance receivers in such a way that the probability of sending their children to school is high. This implies that remittance income could possibly contribute for economic growth indirectly through affecting human capital.

Another way round, remittances may affect total factor productivity growth through effects on the efficiency of investment and through effects on the size of dynamic production externalities generated by an economy (Barajas *et al*., 2009)[4]. By improving the quality of financial intermediation remittances may also improve the efficiency of domestic investment. For example, if recipient family members invest on behalf of the remitter then the efficiency of investment is affected to the extent that the family member possesses some informational advantage relative to formal domestic financial intermediaries (Barajas *et al.*, 2009). Similarly, since remittances expand the quantity of funds flowing through the banking system, remittance flows may affect the ability of the

[4] Various empirical study such as by Gazi and Mohammed (2013), and Rao and Hassan (2009), have formulated TFP to be determined by remittance and other explanatory variables.

recipient economy's financial system to allocate capital by creating economies of scale (Aggarwal *et al.*, 2011).

Therefore, based on the arguments mentioned above, TFP can be formulated simply as:

A = f (H) and H=f(R), which implies that A= f(R)

Where H refers to human capital and R refers to remittance.

In conclusion, following the above explained arguments and formally stating the equations using Cobb-Douglas production function in which output is a function of physical capital (K) and labor force (L);

$$Y = AK^{\alpha} L^{\beta} \quad \text{.....1}$$

Taking the natural logarithm transformation of equation 1 both sides and expanding it to time dimension gives:

$$\ln(Y_t) = \ln(A_t) + \alpha \ln(K_t) + \beta \ln(L_t) \quad \text{.....2}$$

Since A (TFP) is in turn determined by the available stock of Human capital (H) and Remittance income (R), taking the natural logarithm of the function it can be stated as:

$$\ln(A_t) = \gamma_0 + \gamma_1 \ln(H_t) + \gamma_2 (\ln \mathrm{R}_t) \quad \text{.....3}$$

Substituting (3) into (2);

$$\ln(Y_t) = \gamma_0 + \gamma_1 \ln(H_t) + \gamma_2 (\ln \mathrm{R}_t) + \alpha \ln(K_t) + \beta \ln(L_t) \quad \text{.....4}$$

Extended model

The above model (eq. 4) seems to suggest that the only variables that affect growth are H, R, K and L. Rather; various empirical studies have identified different additional variables that are found to be potentially affecting the growth rate of output in cross country growth regressions. Therefore, it is vital to incorporate these additional variables to determine the robustness of the first model (equation 1). By using the notations of the variables used in this study, the model can be presented as follows:

$$\ln(RGDP_t) = \gamma_0 + \gamma_1 \ln(HC_t) + \gamma_2 \ln(REMG_t) + \alpha \ln(GFCFG_t) + \beta \ln(LF_t) + \gamma_3 \ln(GCEG_t) + \gamma_4 \ln(M2)_t + e_t \quad \text{……..5}$$

Where e_t is the idiosyncratic error which is assumed to be independently and identically distributed with mean zero and variance σ^2. Moreover, γ_1, γ_2 , α , β , γ_3, and γ_4 are the elasticity coefficients with respect HC,REMG, GFCFG, LF, GCEG, and M2, respectively.

Description of variables

$\ln(RDGP_t)$: is the log of real GDP

$\ln(HC_t)$: refers to the log of human capital. Various empirical literatures provide different proxy variable regarding human capital. These proxy variables ranges from health expenditure as a percentage of GDP (Abbas and Foreman Peck, 2007) to Human Development Index (HDI) (Jongwitch, 2007) and from primary enrolment rate (Barro, 1990) to secondary enrollment (Edwards (2010) and Abdullaev (2011), among others)

and tertiary enrolment as a percentage of gross enrolment rate (Fayisa and Nsiah, 2010). In this study, tertiary school enrolment as percentage of gross enrollment is proxy for human capital variable, HC_t. The reason why the researcher opted for this is based on recent World Bank (2010b) survey on remittance receivers in Ethiopia where majority of this income is used for covering tuition fee for university education. Moreover, the study mainly focuses on how remittance income is affecting growth through human capital, i.e., income received as remittance is believed to be spent on education and increase tertiary enrollment rate, where productivity is higher compared to either primary or secondary education. Based on the arguments mentioned above, HC is expected to have positive role in increasing output.

$\ln(REMG_t)$: indicates the logarithm of the total remittance income received as a share of GDP. The relation between REMG and economic growth is indeterminate. $\ln(GFCFG_t)$: is the log of physical capital. Though capital is one of the major inputs in the production function, data on the development of the capital stock has been unavailable which obliged researchers to search for proxy variables. Therefore, gross fixed capital formation as a share of GDP is used as a proxy for capital stock. It is hypothesized that GFCFG positively affects growth.

$\ln(LF_t)$: refers to the total amount of labour force in the economy. $\ln(GCEG_t)$: Government consumption expenditure proxies for government expenditure in the economy, which is expected to distort private decision. Thus increase in government consumption expenditure will negatively affect growth rate of output per worker (Barro and Sala-i-Martin, 2004). Empirically, they have found a negative and significant

relationship between government consumption expenditure and economic growth. The same result is also expected in this study.

As an indicator of financial development, this study includes *m*2 (money and quasi money (M2)) in the regression. This measure includes the liquidity liabilities of the financial system which equals currency plus demand and interest-bearing liabilities of banks and nonfinancial intermediaries. Based on empirical literatures, the expected sign of this variable on growth is indeterminate.

3.2. Data Source

This study had used time series data ranging from 1981 to 2012. The choice of data length is based on the availability of data for all the variables under study. The relevant data for this study is used from World Bank (WB) database and MoFED which are perceived to be relevant and reliable. Besides, a constant 2005 USD is used as a base year for real GDP.

3.3. Method of Data Analysis

Both descriptive and econometric methods of data analysis are used. With regard to the former, the study has applied descriptive statistics such as tables and different types of graphs. The econometric part is analyzed using Microfit 4.1 and E-view version 7.2 statistical software packages.

3.4. Methodology

3.4.1. Unit Root Test

When dealing with time series data, it is necessary to assess whether the series is stationary or not. The reason behind is that regression of a non-stationary series on another non-stationary series lead to what is known as spurious regression. Furthermore, statistical tests of the parameters resulting from such regression may be biased and inconsistent. The standard approach to investigate the stationarity of a time series is through unit root tests. Several tests are available but the most commonly used are the Augmented Dickey-Fuller (ADF) and Philip and Peron (PP) tests.

Based on the above argument, this study applies the conventional ADF and PP test in order to test for the order of integration of the series. The study conducts autoregressive unit root because if the series is non stationary, our regression will be spurious. The ADF tests the null hypothesis of the series y_t is integrated order one against it is integrated of order zero. The test is based on the estimation of a test regression which is stated below in a general form where an intercept and trend is included.

$$\Delta y_t = \alpha_1 t + \phi y_{t-1} + \sum_{j=1}^{p} \beta_i \Delta y_{t-j} + e_t \quad \text{……..6}$$

Where: y_t is the variable in the model to be tested for stationarity, p refers to maximal lag length, Δ is the first difference operator and e_t is the error term.

The null hypothesis is $\phi = 1$ against an alternative hypothesis of $\phi < 0$. A rejection of the null hypothesis means that the time series is stationary or it does not contain a unit root while accepting the null indicates that the time series is non-stationary.

The computed value will be compared with MacKinnon (1996) critical values to determine whether the series are stationary or not. An important issue to consider here is the selection of optimal lag length (P). This is due to the fact that when too small P is chosen, the remaining serial correlation in the error will bias the test, and when P is too large it will affect the power of the test.

This study also applies Phillips-Peron test statistic attributed to Phillip (1987) and Phillips and Peron (1988). It can be considered that the PP test, as Dickey Fuller (DF) statistic, has been made robust to serial correlation. PP test is robust with respect to unspecified autocorrelation and heteroscedasticity in the disturbance process of the test equation. The test also makes non parametric correction to t-test.

3.4.2. Long Run Relationship: Cointegration

Over the past few decades, considerable attentions have been paid in empirical economics towards testing the existence of long run relationship among economic variables, particularly using co-integration techniques. There have been two main approaches: the two step residual based procedure for testing the null hypothesis of no co-integration which is attributed to Engle and Granger (1987) and Phillips and Ouliaris (1990), and system based reduced rank regression due to Johansen (1991,1995). There are also other procedures such as the variable addition approach of Park (1990), the

residual-based procedure for testing the null of co-integration by Shin (1994) and the stochastic common trend (system) approach of Stock and Watson (1988) (Pesaran *et al.*, 1999).

All of these approaches of testing long run relationships, however, are not free from drawbacks. For instance, all of these testing procedures require the underlying variables to be integrated of order one I(1). This in turn inevitably requires a certain degree of pre testing, thus introducing a further degree of uncertainty into the analysis of the long run relationship (Cavanagh *et al*., 1995 as cited in Pesaran and Shin, 1999).

In order to test the existence of long run relationship between the dependent variable, real gross domestic product (RGDP) which is a proxy for economic growth and the set of regressors, the study have used an autoregressive distributed lag (ARDL) bound testing approach attributed to Pesaran (2001). This approach is chosen because it has got some superior advantages over the previously mentioned methods. Firstly, as the name suggests, this approach allows both the dependent and independent variables to enter the model with lags, thereby allowing the past values of variables to determine its present values. This flexibility in terms of the structure of lags of the regressors is particularly plausible because reactions to a change in each variable may be different depending on various factors and in some cases they may respond to the changes in underlying factors with a lag; thus there is usually no reason to assume that all regressors should have the same lags as suggested by the co-integration VAR models, where different lags for different variables are not permitted (Pesaran *et al.*, 2001).

Secondly, this method is applicable irrespective of whether the regressor are I(1), I(0) or mutually co-integrated, which implies that there is no need to have prior testing of the order of integration of the variables, unlike the other approaches. Besides, endogeneity and serial correlation problems, that exists in many empirical studies, and inability to test hypothesis on the estimated coefficients in the long run associated with Engle and Granger (1987) method is avoided (Pesaran and Shin, 1999). Apart from this, the long run and short run parameters of the model under consideration are determined simultaneously.

ARDL approach has also additional advantage of yielding consistent and unbiased estimates of the long run coefficients that are asymptotically normal irrespective of whether the underlying regressors are I (1) or I (0) (Pesaran and Shin, 1999; Pesaran *et al.*, 2001). In line with this, ARDL based estimators of the long run coefficients are super consistent and valid inferences can be made using standard normal asymptotic theory (Pesaran and Shin, 1999). This method is also relatively more efficient in the case of small and finite sample size. Another advantage of ARDL model is that it can distinguish between dependent and independent variables and thus allows testing for the existence of the long run relationship between the variables.

The ARDL approach requires three steps. The first step is to check the existence of long run relationship among the variables of interest that is determined by F- test. The second step requires the estimation of long run relationship and to determine their values, thereafter the short run elasticity of the variables with error correction representation of the ARDL model. The purpose of applying the error correction version of the ARDL

model is to determine the speed of adjustment to the equilibrium. Meaning that the ECM estimates the speed at which our dependent variable returns to the equilibrium given the change in the independent variable.

The ARDL bounds test modeling involves estimating the following unrestricted error correction model (UECM) using OLS.

$$\Delta Z_t = \alpha_o + \sum_{i=1}^{k} \beta' \Delta Z_{t-1} + \sum_{i=0}^{k} \delta' \Delta W_{t-i} + \theta_1' Z_{t-1} + \theta_2' W_{t-1} + u_t \quad \text{.....7}$$

Where Δ refers to first difference operator, Z_t vector of dependent variables, W vector of k determinants of Z_t and u_t refers to residual error term which is assumed to be white noise having mean zero and variance covariance of σ^2.

The model in this specific case can be stated as:

$$\begin{aligned}\Delta LRGDP_t = {} & \beta_0 + \sum_{i=1}^{n} \beta_{1t} \Delta LRGDP_{t-1} + \sum_{i=1}^{k} \beta_{2t} \Delta LHC_{t-1} + \sum_{i=1}^{k} \beta_{3t} \Delta LREMG_{t-1} \\ & + \sum_{i=1}^{k} \beta_{4t} \Delta LGFCFG_{t-1} + \sum_{i=1}^{k} \beta_{5t} \Delta LLF_{t-1} + \sum_{i=1}^{k} \beta_{6t} \Delta LGCEG_{t-1} \\ & + \sum_{i=1}^{k} \beta_{7t} \Delta LM2_{t-1} + \alpha_1 LRGDP_{t-1} + \alpha_2 LHC_{t-1} + \alpha_3 LREMG_{t-1} \\ & + \alpha_4 LGFCFG_{t-1} + \alpha_5 LLF_{t-1} + \alpha_6 LGCEG_{t-1} + \alpha_7 LM2_{t-1} + e_t \quad \text{.....8}\end{aligned}$$

Where $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ *and* β_7 characterizes the coefficients of the short run dynamics of the model whereas $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6$ *and* α_7 coefficients show the long run relationship. In order to test the presence of long run relationship between the underlying variables, the above equations is estimated using OLS. To test the significance of lagged

levels of the variables in this study, the appropriate test statistics is the familiar F or Wald test under the generalized Dickey-Fuller types of regressions in an unrestricted error correction regression.

The null hypothesis for test of long run cointegration is stated as follows:

$H_0 : \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = 0$, against

$H_1 : \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq \alpha_6 \neq \alpha_7 \neq 0$

The asymptotic distribution of the F or Wald statistics is non standard under the null hypothesis of no long run relationship. Two sets of critical values are developed by Pesaran *et al* (2001) for two polar cases which assume that all the regressors are on one hand purely integrated of order one and on the other hand all are purely integrated of order zero. Since these two sets of critical values provide critical value bounds for all classification of regressors into purely I(1) and/or purely I(0), they proposed bound testing procedures. If the computed Wald or F-statistic falls outside the critical value bounds, a conclusive inference can be drawn without needing to know whether the underlying regressors are I (1), co-integrated among them or are individually I (0). To be specific, if the computed F statistic is greater than the upper bound critical value, we reject the null hypothesis of no long run relationship. If, however, the computed F statistics is less than the lower bound critical value, we fail to reject the null hypothesis.

If the Wald or F statistic falls inside these critical values' band, inference is inconclusive and knowledge on the order of integration of the underlying variables will be needed before conclusive inference can be made (Pesaran *et al*, 1999). This study is not however

using the critical values developed by Pesaran, because it is based on large sample size observation (500 and above). This study rather used the critical values developed by Narayan (2004) which is based on small sample size between 30 and 80 observations.

Determination of optimal lag structure is crucial in ARDL model, because it helps us to address the issue of over parameterizations and to save the degree of freedom (Taban, 2010 as cited in Tsadkan, 2013). In this study, an AIC is used to determine the maximum lag order of the ARDL model because of its advantage for small sample size as it is the case in this study.

3.4.3. Long Run and Short Run Model Specification

Once the F statistic passes above the upper bound critical value and the existence of long run relationship is confirmed, the long run model can be estimated by OLS.

$$\begin{aligned} LRGDP_t = \alpha_0 &+ \sum_{i=1}^{n} \alpha_1 LRGDP_{t-1} + \sum_{i=1}^{k} \alpha_2 LHC_{t-1} + \sum_{i=1}^{k} \alpha_3 LREMG_{t-1} \\ &+ \sum_{i=1}^{k} \alpha_4 LGFCFG_{t-1} + \sum_{i=1}^{k} \alpha_5 LLF_{t-1} + \sum_{i=1}^{k} \alpha_6 LGCEG_{t-1} \\ &+ \sum_{i=1}^{k} \alpha_7 LM2_{t-1} + e_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 9 \end{aligned}$$

After the long run model is estimated, the next duty is to model the short run dynamics of the model by estimating an Error Correction Model associated with the long run estimates. This is specified as follows:

$$\begin{aligned} \Delta LRGDP_t = \beta_0 + \lambda ECM_{t-1} + \sum_{i=1}^{n} \beta_{1i} \Delta LRGDP_{t-i} + \sum_{i=1}^{k} \beta_{2i} \Delta LHC_{t-i} + \sum_{i=1}^{k} \beta_{3i} \Delta LREMG_{t-1} + \\ + \sum_{i=1}^{k} \beta_{4i} \Delta LGFCFG_{t-i} + \sum_{i=1}^{k} \beta_{5i} \Delta LLF_{t-i} + \sum_{i=1}^{k} \beta_{6i} \Delta LGCEG_{t-i} + \sum_{i=1}^{k} \beta_{7i} \Delta LM2_{t-1} + e_t \ldots 10 \end{aligned}$$

Where: ECM_{t-1} is the error correction term that will be obtained from ARDL long run dynamics of the model and it is expected to have negative sign showing the eliminating speed of the model. In other words, it is the speed of adjustment to restore equilibrium in the dynamics model (how quickly the variables converge to equilibrium).

Before directly get on estimating the long run relationship of the model using ARDL bounds testing procedure, it is must to first test the order of integration of each variables included in the model. This is to ensure that the variables are not cointegrated of order 2 (I(2)). This is because as stated earlier, ARDL approach is based on the assumption that the underlying series is either I(1), I(0) or mutually co-integrated. If the variable are found to be I(2), the computed F or Wald statistic are not going to be valid which may lead to erroneous conclusion.

3.4.4. Testing Causality

The presence of cointegration alone does not indicate the direction of causality. Hence we need to test whether the relationship between the variables is unidirectional or bidirectional. Since the underlying series (LRGDP and LREMG) are integrated of the same order, the ordinary Granger causality test can be applied to perform causality tests. The test proceeds in estimating the following two equations.

$$LRGDP_t = \beta_0 + \sum_{i=1}^{k} \beta_{1i} LRGDP_{t-i} + \sum_{j=1}^{k} \beta_{1j} LREMG_{t-j} + e_{1t} \ldots\ldots\ldots 11$$

$$LREMG_t = \alpha_0 + \sum_{i=1}^{k} \alpha_{1i} LREMG_{t-i} + \sum_{j=1}^{k} \alpha_{1j} LRGDP_{t-j} + e_{2t} \ldots\ldots\ldots\ldots 12$$

The null hypothesis (for equation 11) is that:

$H_0 : \beta_{11} = \beta_{12} = ... = \beta_{1j} = 0$ Implying LREMG does not Granger Cause LRDGP

$H_1 : \beta_{11} \neq \beta_{12} \neq .... \neq \beta_{1j} \neq 0$ Implying LREMG does Granger Cause LRDGP

The null hypothesis (for equation 12) can be stated as:

$H_0 : \alpha_{11} = \alpha_{12} = ... = \alpha_{1j} = 0$ Implying LRGDP does not Granger Cause LREMG

$H_1 : \alpha_{11} \neq \alpha_{12} \neq .... \neq \alpha_{1j} \neq 0$ Implying LRGDP does Granger Cause LREMG

The decision is that there is causality from remittance (LREMG) to economic growth (LRGDP) if the null hypothesis $H_0 : \beta_{11} = \beta_{12} = \ldots = \beta_{1j} = 0$ where $j = 1, 2, \ldots, k$ can be rejected at least at 10% level of significance in the case of equation 11. Similarly, there is causality from economic growth to remittance if the null hypothesis $H_0 : \alpha_{11} = \alpha_{12} = \ldots = \alpha_{1j} = 0$ where $j = 1, 2, \ldots, k$ can be rejected at least at 10% level of significance in the case of equation 12.

CHAPTER FOUR

OVERVIEW OF THE ETHIOPIAN ECONOMY

4.1. General Overview

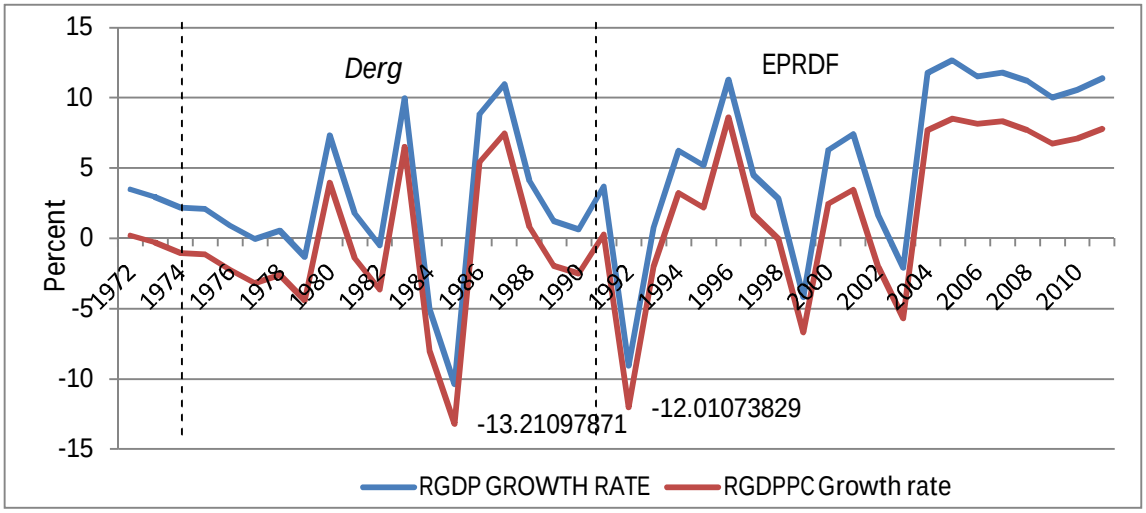
Ethiopia is the second-most populous country in Sub-Saharan Africa with a population of about 92 million in 2012 (WB, 2013). The nation is also one of the world's poorest countries with Gross National per capita income of USD 380 in 2012, the lowest both from the sub Saharan average of USD 1,270 and the world (WB, 2013). According to 2010/11 HICE survey, the proportion of poor people in the country was estimated to be 29.6 per cent (MoFED, 2012).

Over the past decade, however, Ethiopia has achieved high economic growth, averaging 10.9 percent per year (UNDP, 2013). Taking the growth rate over the years 2009-13, with an average growth rate of 9.4 per cent Ethiopia had registered the fastest growth which is far higher than Africa's average (3.6 per cent) (UNECA, 2014). According to World Bank (2013) report, only four other sub-Saharan countries namely Sierra Leone, Niger, Cote d'Ivoire, and Liberia could manage to grow faster than Ethiopia in 2012. This Economic growth is however, primarily driven by service sector and increasing agricultural production on the supply side associated with rising domestic demand, while the performance of the manufacturing sector was relatively modest (WB, 2013).

Although these success stories are exciting, Ethiopia's economic growth was very devastating over the past regimes. During the Imperial period (1930-1974), an attempt was made to modernize the country through the expansion of modern schools and health facilities, the promulgation of a constitution, the development of infrastructure, and the beginning of medium-term planning. Pursuing a market based economic policy, GDP at constant factor cost has grown by 4.6, 3.8 and 1.9 percent during 1953-59, 1960-65 and 1966-73 periods, respectively, which is clearly a downward trend (Alemayehu, 2011).

During *Derg* regime, market forces were deliberately repressed and socialization of the production and distribution process pursued vigorously. Growth was also extremely irregular given its dependence on the agricultural sector, which is vulnerable to the vagaries of nature (Alemayehu, 2011). As figure 4.1 shows, immediately after *Derg* took power, RGDP and RGDP per capita continued to fall which reached -1.3 and -4.4 per cent respectively. Growth further decelerated to -10.4 percent and -13.2 percent in per capita terms in 1984/85 (see Figure 4.1). This dismissal growth was able to recover after short while, though it declined again in the late years of the regime.

Figure 4.1 Real GDP and Real GDP per capita (RGDPPC) Growth Rate



Source: Own computation based on data from MoFED

Various reasons can be attributed for the decelerated growth in the regime. For instance, the abrupt political changes in 1974, coupled with the subsequent nationalization of the productive assets and the complete exclusion of the private sector from the economic activity are the main factors. Besides, the 1984/85 drought, and the presence of intense

internal[5] and foreign conflict with Somalia, which accentuated the dismal growth performance had led to deteriorating economic conditions and mounting discontent.

The early 1990s also witnessed another political change, the coming of the EPRDF to power. Economic growth during the period 1990/91-1991/92 was quite devastating, which is the minimum across the years of the regime. Particularly in 1992, the real GDP and the real GDP per capita was -9 and -12 per cent, respectively. For the period of the whole regime, real GDP and real per-capita GDP grew at average rates of 5.7 and 2.4 percent per annum, respectively. These figures rise to 6.9 and 3.5 percent, respectively, if one excludes the abnormal years 1990-92.

The revival of growth appears to be the combined result of various policy reforms and favorable weather condition. Growth performance has nonetheless been fragile and uneven; on a-year-to year basis, growth was heavily dependent both on the vagaries of nature and on external shocks (Alemayehu, 2011). It can be observed from figure 4.1 that the economy once again went down in 1999 and 2003. The first is associated with the war with Eritrea while the later is linked to the serious drought that hit the economy. Except for the shock years in the regime, the economy has been doing well since post 1991, particularly in the last eight years.

In conclusion, the last four decades have witnessed a cyclical evolution of policy regimes in Ethiopia. The policy environment for growth evolved from a fairly market-oriented

[5] There were a growing number of opposition groups among the intelligentsia that had the objective of overthrowing *Derg*. These groups are *Meison* (referring to Amharic Abbreviation for "All Ethiopia Socialist Movement"), Ethiopian People Revolutionary Party (EPRP), Tigray People Liberation Front (TPLF) and Eritrean People Liberation Front (EPLF) (Alemayehu, 2011).

policy stance to a highly controlled policy regime before being liberalized once again during the EPRDF regime. This cyclical policy posture had contributed and affected a lot for the growth cycle which was favorable in the first and third regimes, and very poor in the second.

4.2. Sectoral Share of the Economy

When talking about the performance of the Ethiopian economy, in one way or another, one is talking about the performance of the agricultural sector. This is because the overall performance of the economy is highly determined by what happens in the agricultural sector. Though the share of agricultural sector to GDP has been declining steadily in the past decade, it continues to be the backbone of the Ethiopian economy. According to UNDP (2013) report, the sector is contributing 42.9 percent to GDP, and accounting for about 85 percent of employment and 70 percent of export earnings in 2012/13. The sector had also continued to be a sole provider of food for domestic consumption and raw materials for domestic manufacturing industries.

Table 4.1 Contribution of Sub-Sectors to Nominal GDP (%)

	Agriculture	Industry	Service
1960/61-1973/74	64.8	9.9	25.3
1974/75-1990/91	55.8	11	33.2
1991/92-2010/11	52	11	37
1960/61-2010/11	57.1	10.6	32.3

Source: Own computation based on data from MoFED

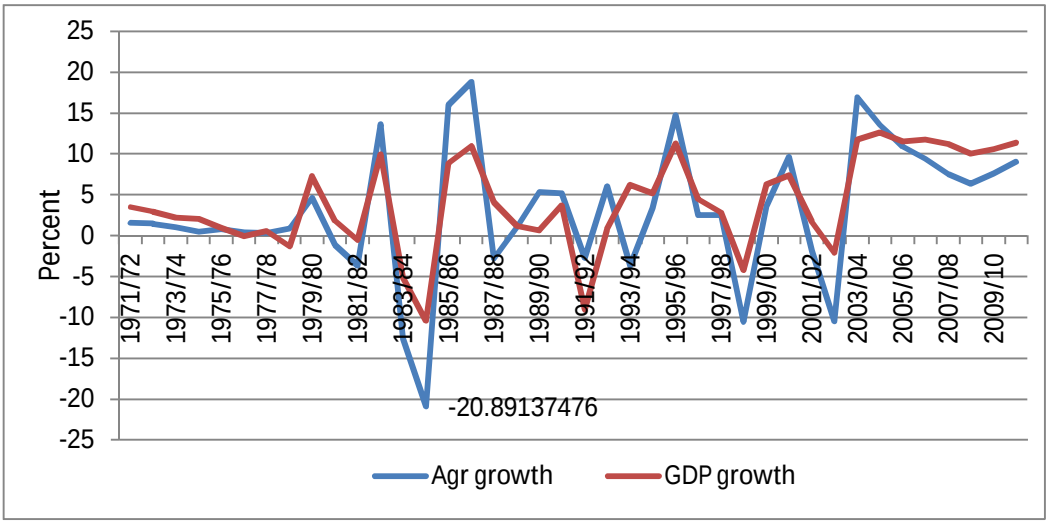
As the above table shows, the GDP contribution of agricultural sector was about 65 per cent during the imperial regime. The agricultural sector's share (although declined to 52 per cent during the present regime) had kept to be the leading throughout the past five decades. Regarding the industrial sector, it had showed no significant growth across the past three regimes. The sectoral contribution of this sector remained about 10 per cent on average throughout the past five decades. On the other hand, service sector[6] is over taking the declining share of the agricultural sector, in which its contribution had increased by 12 per cent in EPRDF regime compared to the imperial regime which was about 25 per cent. This fascinating growth rate registered in the service sector is due to a rapid expansion in financial intermediation, public administration and retail business activities (Tsadkan, 2013).

It is crucial to diagrammatically examine the growth rate of the agricultural sector versus the growth rate of GDP to substantiate the association between the agricultural sector and GDP, apart from the sector's predominant contribution to GDP. As figure 4.2 shows, the agricultural and GDP growth rates show similar rhythmic patterns, which is an indicator of the economy's dependence on what goes on in agriculture. Using a regime wise disaggregation, during the Imperial regime (where the available data starts from 1971/72)

[6] According to MoFED, the service sector in Ethiopia is classified into two major categories. The first one is called "*distributive services*". This includes activities such as trade, hotel and restaurants, transport and communication. The second category, "*other services*" comprises of the banking & insurance, real estate, public administration, education, health and domestic & other services.

the agricultural sector had grown on average by 1.3 per cent which is lower than the GDP growth rate of 2.8 per cent.

Figure 4.2 Agricultural and GDP growth rate at constant prices (%)



Source: Own computation based on data from MoFED

Like the case in the previous regime, the sector's growth during the *Derg* regime is not satisfactory, which is about 1.6 per cent versus 2 per cent growth rate of GDP. This is relatively less both to the growth rate of GDP during the Imperial regime as well as the population growth of 2.5 per cent during the period (Tsadkan, 2013). It can be observed from figure 4.2 that the agricultural sector had shown growth rate of -20.9 per cent in 1984/85, which is principally due to the presence of severe drought during the period. Given the economy's dependence on this sector, this had led to complete deterioration of GDP in the period under consideration.

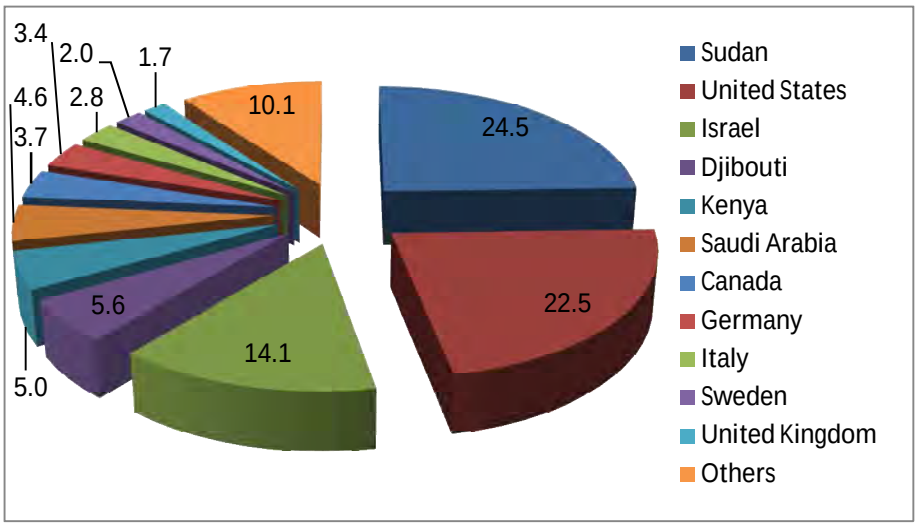
Post 1991, as a result of the present government's substantial effort made to transform the sector by devising the Agricultural Development Led Industrialization (ADLI) policy,

was a favorable period for the growth of both the agricultural and GDP. For instance, for the period of 1991/92 to 2010/11, GDP had grown by 6 per cent while the agricultural sector had grown by 4.7 per cent on average. However, this period had also faced decline in both agricultural and GDP growth rates particularly in 1998/99 and 2002/03 which can be associated to the Ethio-Eritrean war and the severe drought that the nation experienced in 2002/03. Despite all this efforts however, the sector is characterized by low productivity. Besides, the sector is still highly dependent of the gifts of nature which makes the overall economy to be sensitive to the natural shocks that happen in the sector.

4.3. Trends of International Migration and Remittance Flow in Ethiopia

Ethiopia is one of the countries with a large number of migrants in North America, Europe and the Middle East. According to World Bank Migration and Remittance Fact Book (WB, 2011) 620,100 Ethiopian migrants -equivalent to 0.7 per cent of the total population- live in different parts of the world by 2010. In terms of country of destination, the World Bank's bilateral migration matrix data (see figure 4.3) identifies Sudan as the leading destination for Ethiopian migrants (24.5 percent of total migrants), followed by United States (22.5 percent), Israel (14.1 percent), Djibouti (5.6 percent), and Kenya (5 percent).

Figure 4.3 Number of Ethiopian Migrants by country of destination (%)



Source: Calculated from World Bank's Bilateral Estimates of Migrant Stocks in 2010.

This indicates that the top six migrant receiving countries namely; Sudan, United States, Israel, Djibouti, Kenya and Saudi Arabia host about three fourth of the total Ethiopian migrants across the world. In continental wise, the total migrant stocks in Sudan, Kenya and Djibouti account for about 35 per cent of the total migrants of the nation, in contrast to the share of Europe and Asia where the stock of Ethiopian migrants are 14 and 18 percent, respectively. In spite of huge migrant stock in neighboring countries, however, many of the migrants in these countries stay 1-3 years before departure and use them as a transit to other European, Asian and North American nations (Fransen and Kuschminder, 2009).

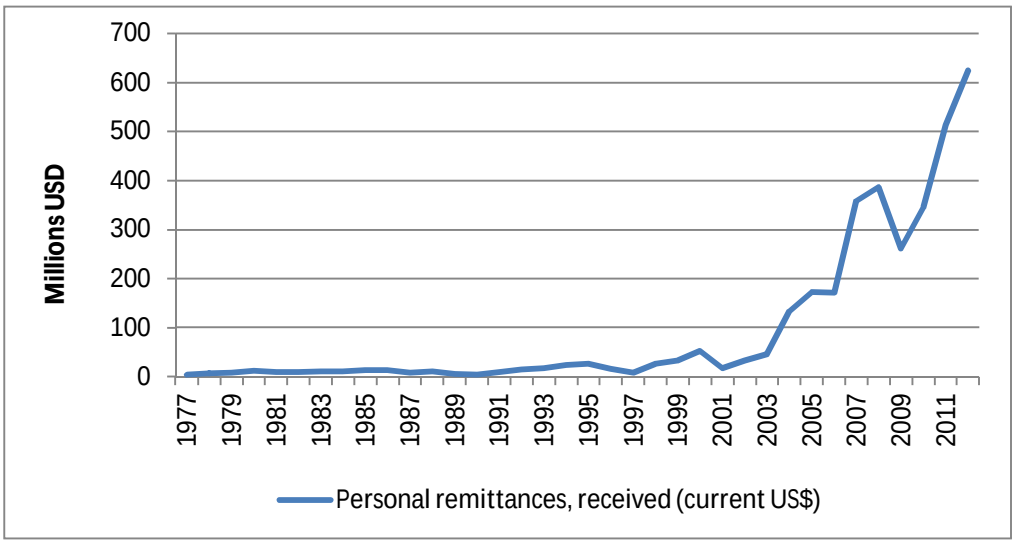
The character and root cause of the Ethiopian migration patterns are diverse and had been through different changes in the past decades. Looking for a better education, employment opportunities, and political instability are considered as major causes for migration. Political migration, in particular, was intensified in Ethiopia during 1970-1990

due to political instability at that time. Recently, the reason for migration is having more of economical motive. For instance, the Middle East has become an important destination for Ethiopian migrants, especially from rural areas, to find better employment opportunities.

One of the positive effects of out migration of people is remittance money that will be sent back to home country. Like many migrants from developing countries, Ethiopian migrants also send money back to their home countries. At macro level, remittance flows are an important and stable sources of external finance, and constitute a substantial part of financial inflows for countries with large migrant labor force in general and Ethiopia in particular (NBE, 2010). At household level, remittances inflows provide an important source of income for families to meet there basic needs. Though Ethiopia is not among the highest remittance receivers, even compared to Sub Saharan countries, the volume of remittance inflow to Ethiopia remarkably increased in the past decades.

As it can be observed from figure 4.4, the total amount of remittance inflow started to show significant increment, mainly since 2003. Between 1977 and 2003 remittance flows have steadily grown from 4 million USD to 47 million USD. By 2004, remittance inflow had over passed 100 million USD. A critical examination of the figure reveals that the inflow of remittances leaps strangely in 2007 which is associated with the celebration of the Ethiopian Millennium. This continuous increase, however, witnessed a slight decline in 2008 after reaching nearly 386 million USD due to the global financial crisis that occurred in the western economies, which is the main source of remittance for Ethiopia.

Figure 4.4 Amount of Remittance Received (Millions of USD)



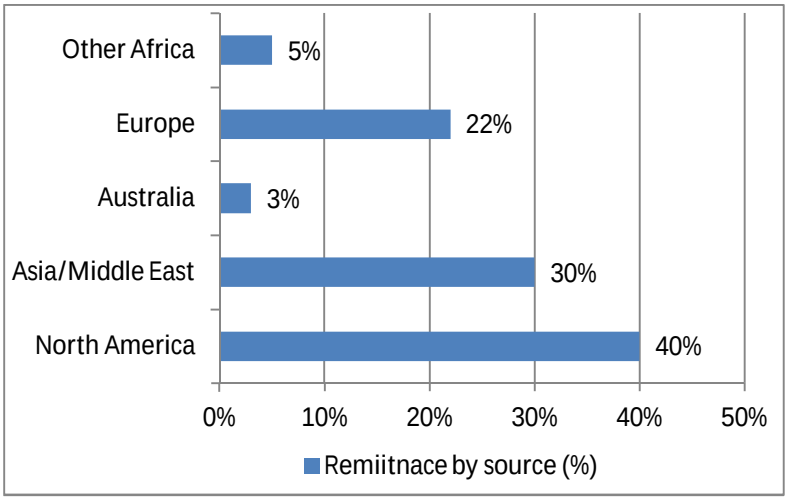
Source: World Development Indicators Database

According to World Bank (2009) report, the global economic crisis had led to 5.5 percent decline in remittance flow to developing countries between 2008 and 2009. In Ethiopia, during this particular period, remittance inflow had declined by about 32 per cent which is by far higher than the average decline for developing countries. Apart from this, however, the year 2010 witnessed an immediate recovery of about 31 per cent and reached nearly 345 million USD. By 2012, the remittance flow had reached about 625 million USD with a growth rate of about 22 percent compared to the previous year's growth of 49 percent.

As various reports indicated, this financial crisis had particularly affected the United States of America which is one of the top hosting countries of Ethiopian migrants. According to World Bank (2010b) survey report on remittance receivers in Ethiopia, North America is the most important source of remittance to Ethiopia with 40 percent of total inflow followed by Asia and Europe accounting for 30 and 22 percent of total inflows, respectively (see Figure 4.5). The reason behind the huge remittance inflow from

North America and Europe is mainly due to higher stock of migrants and migrants' high income. The later reason, however, does not seem to work for migrants in Asia and Middle East. The huge amount of remittance flow from these continents, in particular to Middle East, is related to ever increasing young migrants to Arab countries in search of better job.

Figure 4.5 Remittance Income by source of origin (Continents)

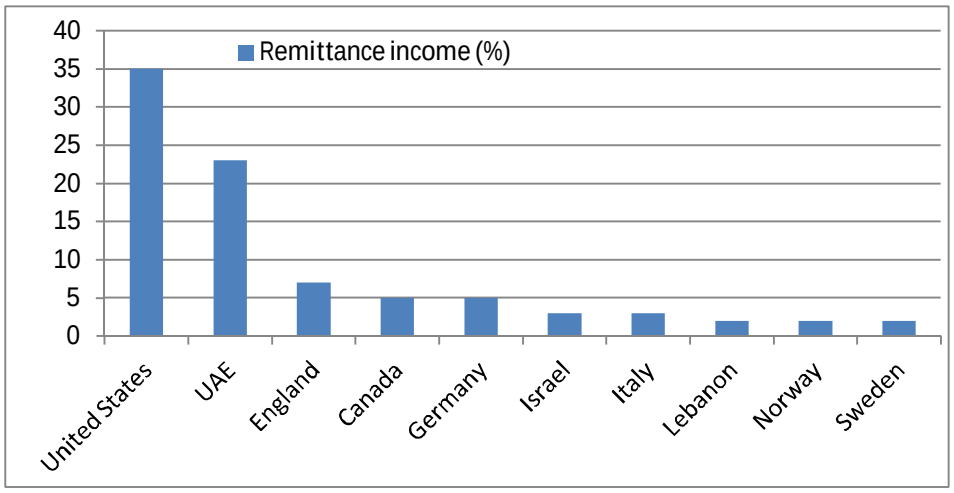


Source: World Bank (2010b)

Looking at the distribution of remittance by country of origin, Unites States of America takes the lead comprising about 35 per cent of remittance income that comes to Ethiopia. This is not surprising given the large number of Ethiopian migrant that the nation accommodates. United Arab Emirate (UAE)-the top remittance sending nation in Asia- is the second most important remittance source with a share of 23 percent. The growing migration of young Ethiopians to the Gulf States in search of employment opportunities can be taken as a reason for this massive flow. The remittance flow from these two countries accounts about 58 percent of the total remittance income for the Ethiopia. As

indicated in figure 4.6, the other major remitting country is England with a share of 7 percent followed by Canada and Germany with 5 percent shares each. The top five remittance sending countries namely USA, UAE, England, Canada and Germany account for about three fourth of the total remittance flow to Ethiopia.

Figure 4.6 Top ten Remittance sending countries to Ethiopia



Source: World Bank (2010b)

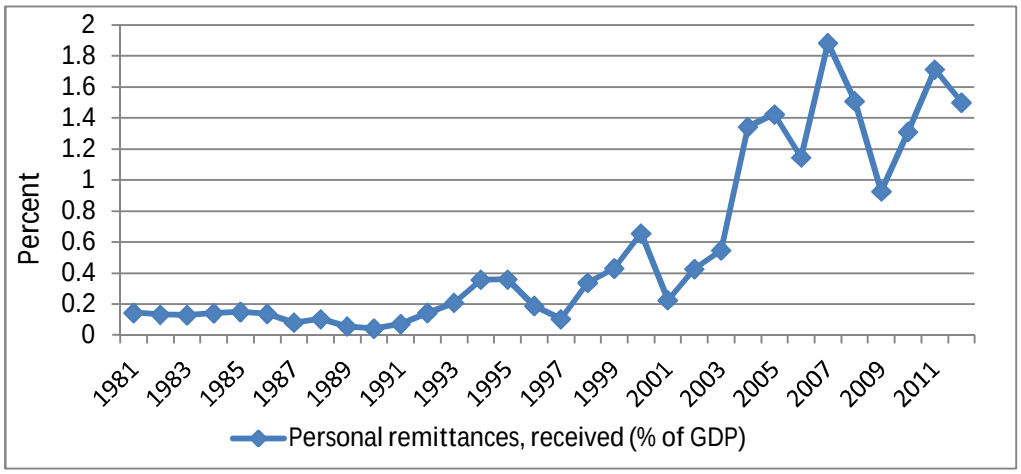
The amount of remittance flowing from other African nations is very little compared to other countries. For instance, South Africa, Sudan and Kenya are the least remittance sending countries. The amount of remittance income flowing from each of these nations constitutes one percent share from the total remittance directed to Ethiopia.

There are various reasons behind the increasing remittance inflow, apart from the growing number of migrant stocks. For instance, the improvements made in the recording system of the remittance and increasing remittance flow networks through large number of remittance service providers can be recognized. Moreover, expanded bank branches which led to extensive coverage and reduction in remitting cost compared to preceding

years had enabled to divert the amount of remittance income that had previously been flowing using the unofficial channel.

In addition to looking at the actual amount of remittance inflow, it would be essential to spot this financial flow in comparison to the GDP. Accordingly, over the past three decades, the total remittance inflow as a percentage of GDP had grown tremendously, even though it was not able to exceed 2 per cent. From its lowest share (0.04%) in 1990, it had achieved a share of about 1.5 per cent in 2012. Within this interval the highest remittance to GDP was recorded in 2007 followed by in 2011 with the share of 1.9% and 1.7%, respectively. As the figure below shows the impact of global financial crisis on remittance income is also reflected on the share of remittance to GDP between the years 2007 and 2009. Moreover, a simple computation reveals that remittance has averaged only 0.56 % of GDP over the last three decades which slightly goes up to 0.8% of GDP excluding the remittance flow in the previous regimes.

Figure 4.7 Remittance Income Received as a percentage of GDP (Current USD)

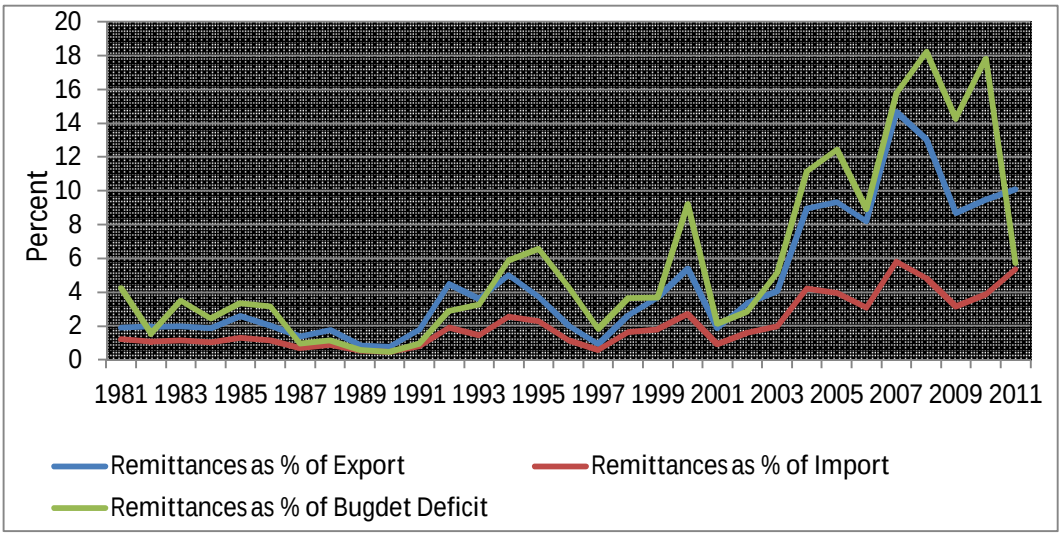


Source: World Development Indicators Database

Another point to look at is the growing role of remittance inflow to finance import expense and remittance income compared to export earnings. As figure 4.8 shows, the share of remittance income as a percentage of export has been growing tremendously particularly since 2001. For instance, in 2007 remittance income earned were about 14.6 per cent of the country's export earnings. Moreover, remittance income was able to cover about 5.8 per cent of import expenditure of the nation.

Comparing across the past two regimes, the share of remittance income as a percentage of both export and import was not more than 3 per cent during *Derg* regime, which can be associated with the small amount of remittance income. This scenario was completely changed during the present regime where the contribution of remittance had reached as much as 14 and 5.8 per cent as a percentage of export and import, respectively.

Figure 4.8 Remittance Income as a percentage of Export, Import and Budget Deficit

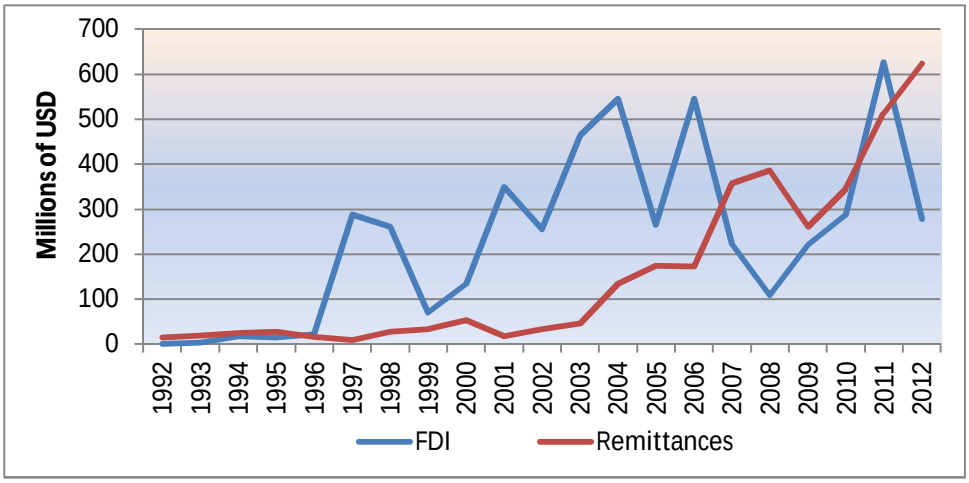


Source: Own computation based on data from WDI and MoFED

The growing remittance flow can also be seen via-a-vis government deficit. With the growing government budget deficit, the role of remittance income as an alternative means of financing this gap had become evident. Over the past three decades, remittance income is able to cover government budget deficit by an average of 5.75 percent. This ranges from the lowest share in 1990 which is only 0.47 to 18 percent in 2008. The lowest share of remittance to budget deficit in 1990 is due to the relatively high budget deficit (about 1 billion USD) versus the low level of remittance flow which is only 5 million USD.

The importance of remittance to the Ethiopian economy becomes vividly apparent when the remittance figures are compared to other external financial income sources of Ethiopia. As the previous discussion indicated, Ethiopia has experienced a continuing surge in inward remittances flows both in terms of volume and in terms of share of GDP over the past twenty years. Likewise, government has been encouraging the FDI inflows by making investment climates conducive to the foreign investors. However, it has now become evident that the less anticipated remittance has performed well than FDI.

Figure 4.9 Remittance Vs FDI flow



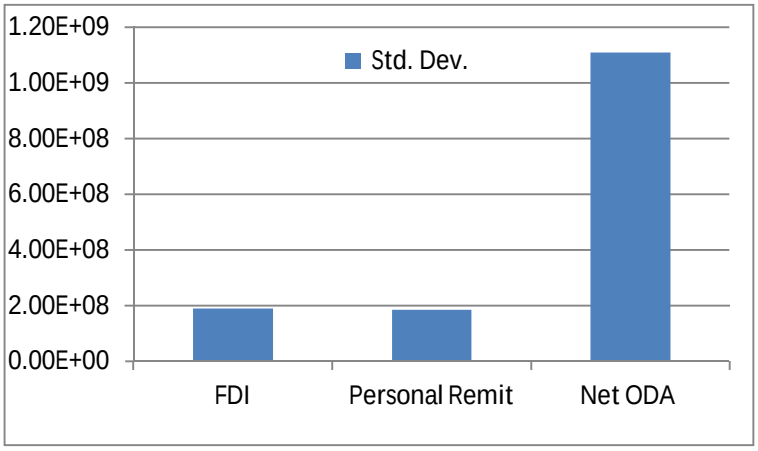
Source: World Development Indicators

As figure 4.9 reveals, prior to 1996 remittance transfer had over passed the FDI, although in subsequent years the total amount of FDI flow to the country had by far passed the remittance income. Between 2007 and 2010 where the remittance flow was characterized by significant decline and an immediate recovery, the remittance flow was higher than the FDI flow. Recently after 2011, there is a clear indication that the remittance flow is increasing continuously, unlike the FDI where there is a substantial declining trend.

Similar pattern can be observed when looking at the share of remittance and FDI as a percentage of GDP. According to the researcher's calculation for instance, FDI contributed only about 1.16 per cent to the GDP while remittance transfer accounted for 1.88 per cent of the GDP in 2007. The share of FDI in GDP was only 0.67 per cent in 2012 whereas remittances accounted for about 1.5 per cent of GDP during the same year. If one looks the average share of FDI in the past five years, it was around 1 percent versus 1.4 percent average share of remittance.

One of the remarkable features of remittances in the literature of growth is its resilience. Compared to other flows, remittances are resilient and stable. From the graph below one can notice that compared to official development assistance (ODA) and FDI, remittances inflows to Ethiopia are stable. The volatility of the three variables which can be explained by the standard deviation of each variable had indicated that remittances have the smallest variation across years as compared to other capital flows (see figure 4.10).

Figure 4.10 Standard Deviation of FDI, Remittance and Net ODA



Source: Own computation based on data from World Bank

4.4. Overview of Remittance Service Providers (RSPs) in Ethiopia

4.4.1. General Overview of the Industry

The Ethiopian remittance services sector is characterized by the presence of both state-owned and private sector banks, several money transfer operators (MTOs), and a significant proportion of informal service providers. Compared to African countries such as Ghana or Kenya, however, the number of formal RSPs which comprises of commercial banks and money transfer operators are extremely limited in Ethiopia, partly because of low levels of overall financial development (Alemayehu *et al.*, 2011).

According to the data obtained from NBE, as of June 2014 there are about 90 remittance service providers operating with 17 commercial banks (2 state owned[7] and 15 private[8]),

[7] These banks are Commercial Bank of Ethiopia (CBE) and Construction and Business Bank (CBB)

[8] Private banks engaged in remittance transfer are Oromia International Bank, United Bank, Zemen Bank, Lion International Bank S.C., Bank of Abyssinia, Wegagen Bank S.C., Nib International Bank S.C., Dashen Bank, Awash International Bank S.C., Bunna International Bank, Addis International Bank, Abay Bank S.C., Debub Global Bank, Berhan International Bank and Enat Bank S.C.

one cooperative bank (Cooperative Bank of Oromia) and Ethiopian Postal Enterprise. This figure, particularly that of MTOs and Private commercial banks, has considerably increased compared to 2008 where only six MTOs and eight private commercial banks were in the industry (Irving *et al.*, 2010). Of these banks, CBE takes the lead by working with 32 RSPs followed by Wegagen and Oromia International Bank with 30 and 20 RSPs, respectively. CBE, as a primary choice for majority RSPs in the remittance transfer market, is due to the huge branch expansion that the bank is undertaking recently which is a vital step to address the unbanked society in general and remittance receivers in particular.

To be specific, as of the mid-2008 RSP survey, the eight private commercial banks providing remittance delivery services had a combined total of 298 bank branches in the country, fewer than half of which were outside of Addis Ababa. However, the two state-owned banks that provide remittance services had a combined total of 232 branches, nearly three-quarters of which were outside of Addis Ababa (Irving *et al.*, 2010). Another option to address large coverage is the use of Ethiopian Postal Enterprise as a means of remittance transferring tool, as this enterprise has widespread geographical presence. However, only two RSPs namely Western Union and Flow cash are working with the enterprise for this purpose.

Referring to RSPs[9], Western union is the dominant player in the field both in terms of the amount of remittance transferred and the number of banks it is operating with. For

[9] According to a study made on money transfer operators participating in the remittance market in Africa, in Ethiopia Western Union, Express Money Transfer, Money Gram and Coinstar account for 33%, 22%, 14% and 2% remittance market shares respectively (IFAD, 2009).

instance, Western Union operates with all the banks listed as well as the Ethiopian Postal Enterprise, and is able to transfer more than 300 million USD in the last fiscal year through CBE only. It is followed by Express Money which channeled more than 100 million dollars through the same bank in the same year, although the number of banks in which it is operating with is eleven. Money Gram and Dahabshil are other dominant RSPs who are operating with all the banks except Berhan and Zemen, respectively.

Significant amount of remittances flow in Ethiopia come through SWIFT, the Belgian based society for worldwide international financial telecommunications. SWIFT has a membership of 10000 financial institutions in 220 countries. It is a cooperative society based instrument that facilitates exchange of financial messages at international levels for fast and effective money transfers. It is a secure method of telecommunication and is extremely cost effective. In this system, banks are identified through two important secret codes called Bank Identifier Code (BIC) and International Bank Account Numbers (IBAN). The former represents the bank's address and distinguishes the financial institutions in question while the latter is a code that uniquely connects the bank with the respective account. These guarantee secure communication and reliable services. This enables banks to directly offer the money transfer service, without involvement of agents.

According to NBE, all banks in Ethiopia are SWIFT users. More than 25 money transfer companies in the business allow customers to collect money from the branches of any bank that has a deal with the particular transfer company as part of the requirement by NBE. Remittance service providers shall also charge minimum or no tariff at all for the

service they provide in Ethiopia, a condition that reduces the cost of transfer, according to the NBE directive No. 30/2006.

4.4.2. Cost of Money Transfer to Ethiopia

It is known that high transfer costs affect the amount of remittance sent by remitters. Although the burden, in terms of service charge, of remittance recipients had been eliminated both by banks and other RSPs, the fees and other related costs for these transactions are still present on the senders' side. Thus, cost of remittance sending can be considered as one factor hindering the use of formal channel of remittance sending which leads to huge informal flow of remittance.

The payment methods can be categorized into two types. One payment structure is based on a fixed percentage of fees on either the amount transferred or per transaction conducted. To mention few, for instance, Dahabshil, KAAH Express and Amal Express Money Transfer charge 0.5% of the amount transferred which goes parallel along with the amount sent. Likewise, Express Money Transfer requires a transfer payment which is 3.3% of every transaction undertaken (NBE, 2008).

The other way is depending on the proportion of the money transferred with specific dollar range of transfer brackets constructed. Accordingly, the rate might be either a fixed dollar or percentage of the amount in the bracket which varies across the amount bracket in which the money transferred is found. For illustration, Bahrain Financing Company charges $4.00, $9.00, and $17.00 for amount transferred <$600, $ 601 - $2500 and $2501-$5000, respectively. On the other hand, Atlantic International costs 2% for amount

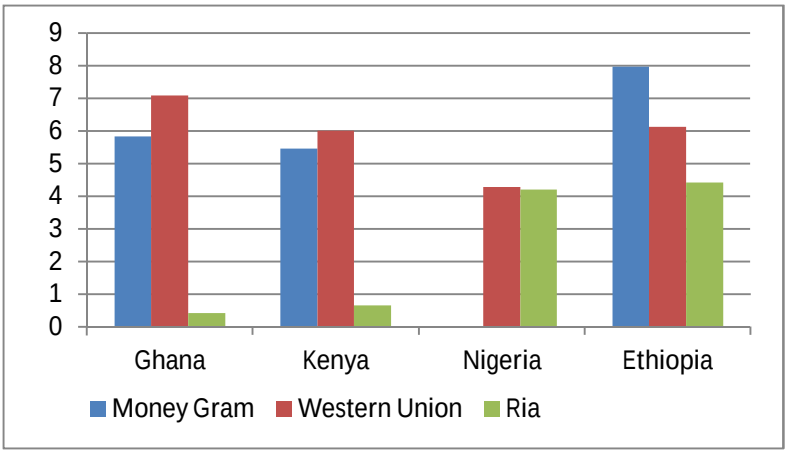
transferred less than $1000. If the amount sent is $1001 and above the cost of sending becomes 1.5% of the amount. ARY, Adams Funds Transfer Services LLC and VIGO are some of RSPs who use this scheme.

The high cost of remittance sending has also an implication in choosing between the formal and informal methods. According to recent survey by Irving, Mohapatra, and Ratha (2010), about 70% of central banks reported high cost associated with remittance sending as one of the factors inhibiting the use of formal remittance channels in Sub Saharan Africa followed by absence of bank branch near to the beneficiary.

Referring to the Ethiopian context in particular, according to the World Bank remittance price data[10], Ethiopia is the most costly country to remit to from the sample of other African countries. For instance, sending $200 from the United States through Money Gram requires a transaction cost of 8 per cent of the amount sent, in contrast to about 5.5 and 5.9 per cent transaction cost to send the same amount of money to Kenya and Ghana, respectively. Similarly, if an Ethiopian living in US wants to send $200 using Ria to transfer money back to home country, the transfer cost is as high as 4.4% of the amount sent, unlike 0.42 percent to Ghana and 0.67 percent to Kenya (see figure 4.11).

[10] *Remittance Prices Worldwide* data provides information on the cost of sending and receiving small amounts of money from one country to another. It covers 226 "country corridors" which include 32 major remittance sending countries and 89 receiving countries.

Figure 4.11 Average cost of sending money from USA to Ethiopia (per USD 200)



Source: World Bank's Remittance Prices Worldwide database (accessed June 2014)

In conclusion, evidence based on surveys suggests that remittance flows respond counter cyclically to reductions in costs. This implies that reducing remittance costs can lead to increases in the remittances sent by migrants, and hence increasing the resources available to recipient households. High remittance costs, on the other hand, represent an unnecessary burden on the migrants and likely reduce the amounts sent and their development impact (World Bank 2006). According to IFAD (2009), these high remittance costs are related to the low level of financial and the small number of firms handling remittance transfers. With regard to the first, low level of financial development in particular to the receiving country makes the transaction to be conducted primarily through money transfer companies or through banks acting as agents of money transfer companies rather than through potentially less expensive account-to-account and/or cash-cash transfers.

CHAPTER FIVE

RESULTS AND DISCUSSIONS

5.1. Empirical Results for Unit Root Testing

As it is discussed in chapter three of this paper, it is vital and must to test the nature of stationarity of the variables before running ARDL model, a model used to determine the existence of long run relationship among the variables. Doing so avoids the possibility of running a spurious regression, which makes the result to be unreliable and inconsistent. The ADF test results of the variables used in the study is presented in the following table.

Table 5.1 Results of Augmented Dickey Fuller Test

Variables	ADF t-statistic at level I(0)			ADF t-statistic at first difference I(1)		Order of integration
	Intercept (C)	Intercept and trend (C&T)	None	Intercept (C)	Intercept & trend (C&T)	
LRGDP	2.118946 [0]	-0.695095[0]	3.868583[0]	-4.195042[0]***	-3.558435[4]*	I(1)
LHC	1.369128[0]	-0.789288[0]	1.886723[0]	-5.126647[0]***	-5.576251[0]***	I(1)
LREMG	0.7724[0]	-2.933594[2]	-1.005790[0]	-5.622973[0]***	-5.556373[0]***	I(1)
LGFCFG	-1.507632[0]	-5.661100[7]***	-1.016874[0]	-9.127167[0]***	-9.027477[0]***	I(0)
LLF	1.226020[0]	-1.814974[0]	14.50223[0]	-4.662112[0]***	-4.748373[0]***	I(1)
LGCEG	-1.913046[0]	-1.859485[0]	-0.059572[0]	-4.585888[0]***	-4.514466[0]***	I(1)
LM2	-0.676911[0]	-1.614455[0]	2.627549[0]	-4.036860[0]***	-3.964714[0]**	I(1)

Mackinnon (1996) Critical Values					
		Intercept	Intercept and trend	None	Significance
Mackinnon Critical Values	1%	-3.610453	-4.211868	-2.624057	***
	5%	-2.938987	-3.529758	-1.949319	**
	10%	-2.607932	-3.196411	-1.611711	*

Source: E-views 7.2 output. *, ** and *** imply statistical significance at 10%, 5% and 1% level of significance, respectively.

Where LRGDP is the natural log of Real Gross Domestic Product, LHC is the natural log of human capital proxied by tertiary enrollment rate, LLF is the natural log of labor force, LGFCFG is the natural log of gross capital formation as a share of GDP which is a proxy for capital, LGCEG refers to the natural logarithm of Government Consumption Expenditure as a share of GDP and LM2 is the natural log of money supply.

If the ADF test statistics is less than the critical value, the decision rule is fail to reject the null hypothesis of unit root or non stationarity. In this case the time series variables are non stationary or has unit root. Conversely, in case where the ADF test statistics is greater than the critical value indicates rejection of the null hypothesis implying the stationarity of the time series variable.

As table 5.1 above indicates, the null hypothesis of no stationarity (unit root) cannot be rejected for all variables in level except for LGFCFG which is stationary at 1% level of significance. However, every variable become stationary either with trend or without trend once they are first differenced. This indicates that none of the above variables are integrated of order two (I (2)), which is a pre condition to use ARDL model.

The study had also applied the PP test for unit root, which is another common way of testing the stationarity of time series variables. The table below presents the results for the PP test of unit root for the variables used in this model.

Table 5.2 Results of Philips- Peron Test for Unit Root

Variables	P-P t-statistic at level I(0)			P-P t-statistic at first difference I(1)			Order of integration
	Intercept (C)	Intercept and trend (C&T)	None	Intercept (C)	Intercept and trend (C&T)	None	
LRGDP	3.904314	-0.278752	3.560330	-4.23114***	-5.741442***	-3.06339***	I(1)
LHC	1.499522	-0.789288	1.288536	-5.12504***	-5.576276***	-4.00305***	I(1)
LREMG	-0.670548	-2.545918	-1.905520*	-8.59004***	-9.827453***	-5.62557***	I(1)
LGFCFG	-1.186688	-3.673198**	-1.884313*	-12.6305***	-14.28754***	-9.38138***	I(0)
LLF	1.933687	-1.821582	16.70988	-4.63864***	-5.019523***	-0.971640	I(1)
LGCEG	-2.112112	-2.106163	-0.044161	-4.51611***	-4.421168***	-4.60521***	I(1)
LM2	-0.774664	-1.614455	2.298363	-3.90891***	-3.787877**	-3.55306***	I(1)

Source: E-views 7.2 output. *, ** and *** imply statistical significance at 10%, 5% and 1% level of significance, respectively.

The PP test for unit root had came up with the same result like the previous ADF test in which LGFCFG is stationary at level at 5% level of significance. Whereas all the variables used in the model become stationary after they are first differenced. In other words, the variables used in the model are a mixture of I(0) and I(1) and none of the variables are integrated of order two (I(2)). As a result, Autoregressive Distributed Lag approach to Cointegration is the right technique to apply in this scenario.

5.2. Bounds Test for Long Run Relationship

In the ARDL approach to Cointegration, the first step is to test the presence of cointegration or long run relationship among the variables. This test for the long run relationship is done using the F-statistic. Given the annual nature of the data; it is recommended that the optimal lag length for the ARDL model is maximum two lags. Moreover, AIC is used to determine the optimal lag because of small sample size at hand.

The test procedure starts with estimating an OLS regression for the first difference part of equation (equation 9) and then test for the joint significance the parameters of the lagged level variables when added to the first difference regression. Pesaran (2001) explained that this OLS regression in first difference is of no direct interest to the bounds cointegration test, it is rather used to simply look at the joint significance of the variables. The F-test statistics, which is derived from this regression output, tests the joint null hypothesis that the coefficients of lagged level variables are zero meaning; there is no long run relationship. The F statistic will then be compared with the lower and upper bounds of Narayan (2004) critical values, based on the rational mentioned in chapter three.

If the F-statistic is greater than the upper bound it can be concluded that there is long run relationship among the variables. On the other hand, if the F-statistic is less than the lower bound test one can conclude that there is no long run relationship among the variables under consideration. However, these are the two extreme cases in which one can conclude with confidence about the long relationship among the variables. In case where the F-statistic falls between the upper and lower bound critical values, it is difficult

to arrive at a conclusion on either the existence or absence of long run relationship. In this situation, it is must to look at the sign and significance of the error correction model to come up with concrete conclusion.

Table 5.3 Critical values for Upper and Lower Bound

Critical values: Intercept & trend (Case III)	Pesaran *et al* (2001); k=6		Narayan (2004); k=6, n=32	
	Lower bound (I(0))	Upper bound (I(1))	Lower bound (I(0))	Upper bound (I(1))
1%	3.668	4.978	4.180	6.060
5%	2.945	4.088	2.913	4.416
10%	2.578	3.646	2.429	3.727

Where, k= is number of regressors and n is number of observations

Source: Pesaran (2001) and Narayan (2004) critical value tables

Accordingly, by including intercept and trend (case III), the calculated F statistics (9.1543) is higher than the Narayan (2004) upper bound critical value both at 1 per cent and 5 per cent level of significance i.e., 6.060 and 4.416, respectively. As a result, it is possible to reject the null hypothesis of no cointegration. In other words, the result implies that the variables are cointegrated in the long run.

5.3. Diagnostic and Stability Tests

The last and most important step in any empirical study is testing the soundness of the model. In this study the researcher had conducted a number of model stability and diagnostic tests. These tests include test for serial correlation (Brush and Godfray LM test), functional misspecification test (Ramsey's RESET test), test for normality (Jaque-Bera test) and heterosckedasticity test.

Table 5.4 Diagnostic test results for the Long Run ARDL (2,0,2,1,0,2,1) model

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= 3.0723[.080]	F(1, 13)= 1.4832[.245]
B:Functional Form	CHSQ(1)= 3.8582[.050]	F(1, 13)= 1.9187[.189]
C:Normality	CHSQ(2)= .38686[.824]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .019704[.888]	F(1, 28)= .018403[.893]

Source: Microfit 4.1 output

From the above table, the following conclusions can be drawn.

A: Using the Lagrange multiplier test of residual serial correlation, the null hypothesis of no serial correlation (Brush - Godfray LM test) is failed to be rejected. For the reason that, the p- value associated with the test statistic (0.08) is greater than the standard significance level which is 0.05. This LM test for serial correlation is applied since; it resolves the drawback associated with the traditional Durbin Watson test statistic i.e. it is not allowed to use DW test statistic as long as the lagged value of the dependent variable is incorporated as a regressor in the model.

B**:** We could not reject the Ramsey RESET test, using the square of the fitted values, which tests whether the model suffers from omitted variable bias or not. That means we failed to reject the null hypothesis of Ramsey RESET test which says that the model is correctly specified. This is because the probability value (0.05) is equal to the conventional significance value. The result proves that the model did not have omitted variable bias.

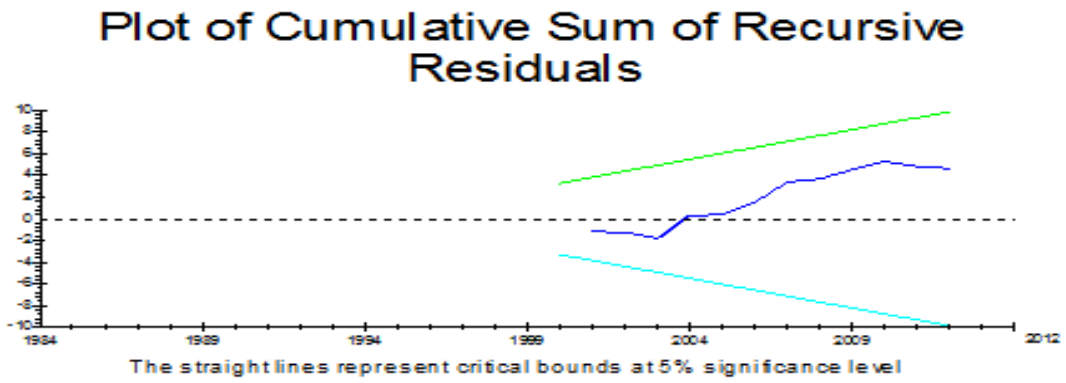
C: Based on a test of skewness and kurtosis of residuals, we cannot reject the null hypothesis which says that the residuals are normally distributed. For the reason that, the p value associated with the Jaque-Berra normality test (0.824) is higher than 0.05 we accept that the error term is normally distributed.

D: Relying on the regression of squared residuals on squared fitted values, the null hypothesis of no heteroscedasticity is failed to be rejected at 5% significance level. This is because; the calculated value (.888) is greater than 0.05.

Pesaran and Shin (1997) further suggested that structural stability or presence of structural break of the long run and short run relationships for the sample period can be better examined by cumulative sum (CUMSUM) and the cumulative sum of squares (CUMSUMSQ) of the recursive residual test. The test is based the first set of n observations and is updated recursively which will then be plotted against the break points to assess the given parameter consistency. In this study the plot of CUMSUM and CUMSUMSQ starts from 2000, implying that the test is based on the recursive residuals from observations before 2000. The test chooses the first n observation by itself.

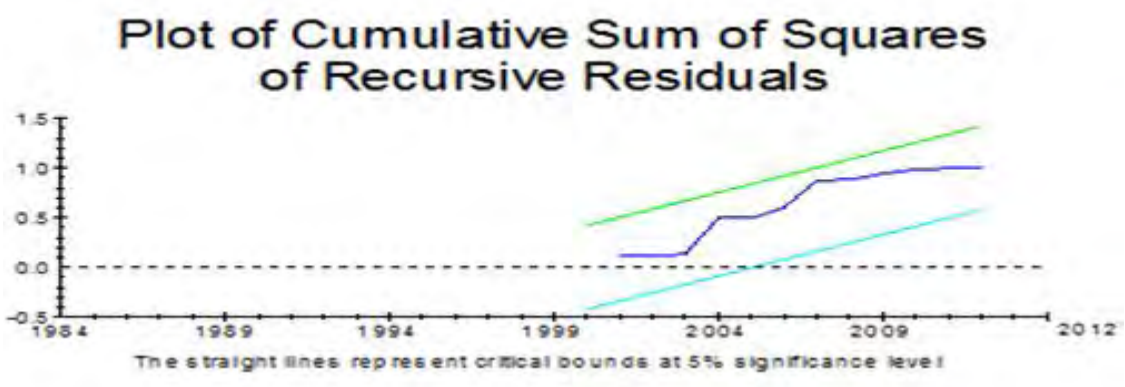
For the stability test the graph plots both the cumulative sum and the 5% critical lines. And, if the cumulative sum remains inside between the two critical lines or bounds back after it is out of the boundary lines, the null hypothesis of correct specification of the model cannot be rejected. But, if the cum sum goes outside (never returns back) between the two critical bounds there exists series parameter instability problem.

Figure 5.1 Graphical Representation of CUMSUM Result



Source: Microfit 4.1 output

Figure 5.2 Graphical Representation of CUMSUMSQ Result



Source: Microfit 4.1 output

As the two plots above clearly reveal the plots of CUMSUM and CUMSUMSQ stay within the lines, and, therefore, this confirms the equation is correctly specified and the model is stable. Furthermore, the result shows that there is no structural instability in the model during the sample period. From this, the model appears to be robust in estimating short run and long run relationship between real gross domestic product and the included regressor. According to Tsadkan (2013), these tests are better over Chow break point test for parameter stability because the latter has a problem in that each sub sample requires at least as many observations as the number of parameters to be estimated.

5.4. Long Run ARDL Model

Based on the confirmation obtained from the unit root test about the absence of a variable which is integrated of order two and given the F statistic result which indicated the existence of long run cointegration among the variables, it is now possible to proceed to the estimation of the long run coefficients of the model. The following table presents the results found after running the appropriate ARDL model to find out the long run coefficients. The figures in bracket are number of lag chosen by the model for each variable.

Table 5.5 Estimated Long Run Coefficients using the ARDL Approach

ARDL (2,0,2,1,0,2,1) selected based on Akaike Information Criterion (AIC)

Dependent variable is LRGDP

30 observations used for estimation from 1983 to 2012

Regressors	Coefficient	St. Error	T-Ratio [Prob]
LHC	.42110***	.086476	4.8695[.000]
LREMG	.11931***	.038409	3.1062[.008]
LGFCFG	.54750**	.19777	2.7684[.015]
LLF	3.6114**	1.4294	2.5265[.024]
LGCEG	-.046788	.072690	-.64366[.530]
LM2	-.22893	.15388	-1.4877[.159]
C	-32.2871	21.7196	-1.4865[.159]
T	-.10125**	.042137	-2.4028[.031]

Source: Microfit 4.1 ARDL (2,0,2,1,0,2,1) model estimate result

In line with what the theory explains and to the researcher's expectation, the result of the study indicated that Human capital which is proximated by tertiary enrollment rate have positive and statistically significant impact on output. Figuratively speaking, a 1 per cent increase in tertiary enrollment is associated with 0.42 per cent increase in output. This can be explained by the fact that a highly skilled workforce promotes productivity and efficiency which in turn increases output. Besides, the recent huge expansion in education sector, particularly in tertiary education can be taken the reason behind the positive role of human capital on output. The result is in line with the outcome found by Driffield and Jones (2013), and Fayissa and Nsiah (2008) where human capital is found to positively and significantly affecting output.

The estimated long run coefficient for remittance (as a share of GDP) shows that remittance has positive and significant effect on economic growth during the study period. Other things being unchanged, a 1 percent increase in remittance income as a share of GDP leads to an average of 0.12 percent boost in real GDP. What the finding suggests is that a significant portion of remittance inflows is directed to productive investments in the long run, and even the short run effect has a multiplier effect. In other words, remittance income is capable of inducing an increase in aggregate demand, leading to a rise in national output and subsequent increase in real income growth. This result is consistent with the finding of Fayissa and Nsiah (2008) for 37 African countries that remittances boost economic growth in countries where the financial systems are underdeveloped. Likewise, Giuliano and Ruiz-Arranz (2005) found a positive effect of remittances on growth, specifically for countries with lower financial development. Moreover, empirical studies by Qayyum et al (2008) in case of Pakistan, Jaweed and Ali Raza (2012) in case of Korea, Ikechi and Anayochukwu (2013) in case of Nigeria, Ghana and South Africa, and Ziesemer (2007) to mention few, had arrived at similar conclusion.

Another important variable in growth literature is investment in capital. This is because of the notion that greater capital stock funds investment and business development, which drives growth. Like many empirical findings, it is found that investment in physical capital as measured by the gross fixed capital formation as a share of GDP (GFCFG) has a positive and statistically significant impact on the real GDP. A 10 per cent increase in gross fixed capital formation as a share of GDP leads to about an average of 5.5 percent increments in output. The result is consistent with the findings of Solow (1956), Barro

(1990), Temple (1999), Fayissa and Nsiah (2008), Edwards (2010) in case of Latin American and Caribbean Countries, and Catrinescu (2006), to mention few.

According to various growth literatures, labour is considered as a determinant factor for growth. Accordingly, in this study labor is also found to be positively and significantly affecting output. This is not surprising result given the dependence of the economy on agriculture and more than 80 per cent of the population lives in this sector. Moreover, the labour force variable used here is assumed to represent the unskilled labour as the skilled is measured by human capital. In particular, a 1 percent increase in labour force contributes to about 3.6 per cent increase in output.

Both LGCEG and LM2 are found to affect output negatively in the long run, although both variables are insignificant in this model. The reason behind the former is that government consumption proxies for government expenses that, although they do not have a direct effect on productivity, distort private decisions, and thus an increase in government consumption will negatively affect output (Barro & Sala-i-Martin, 2004; as cited in Garcia-Fuentes and Kennedy, 2009). Similarly, Barro and Sala-i-Martin (2004) also argue that government consumption proxies for political corruption and other undesirable government aspects, as well as for direct effects of nonproductive public expenditures. Therefore, as the result indicates government consumption expenditure is spent on unproductive sector and is particularly characterized by its wasteful nature. This result is in line with Garcia-Fuentes and Kennedy (2009) and Tsadkan (2013).

Regarding the later, many empirical studies such as Alemayehu (2011) had showed that increase in money supply leads to inflationary situation under poor macroeconomic

management. The high variability of inflation can depress long term investment since this can be regarded as a signal of government malfunctioning. This in turn becomes an obstacle for output growth. The result of this study is similar to that of Garcia-Fuentes and Kennedy (2009).

The estimated long run equation (equation 10) with figures in the parenthesis indicating calculated "t" values can be presented as follows:

$$LRGDP = -32.28 + 0.42LHC + 0.119LREMG + 0.54LGFCFG$$
$$(-1.48) \qquad (4.86) \qquad (3.10) \qquad (2.76)$$
$$+ 3.61LLF - 0.046LGCEG - 0.228LM2$$
$$(2.52) \qquad (-0.64) \qquad (-1.48)$$

5.5. Error Correction Model

The next step that follows from the estimation of the long run coefficients is the estimation of error correction model which is the error correction representation of the long run model. This representation shows the short run dynamics of the model along with the equilibrium of the model.

Theoretically, the ECM term indicate the speed of adjustment to restore equilibrium in the dynamic model and the coefficient of the ECM which should be both negative and statistically significant, shows how quickly the dependent variable converge to equilibrium.

As table 5.6 reveals, the short run model results are consistent with the long run estimates except for remittances and government consumption expenditure both as a share of GDP.

For instance, human capital is found to significantly and positively affecting output which is similar to the long run result. However, the elasticity in this case is 0.22 which indicates that a 10 per cent increase in tertiary enrollment in the short run induces output by an average of 2 per cent compared to about 4 per cent in the long run.

Table 5.6 Error Correction Representation for the Selected ARDL Model

ARDL (2,0,2,1,0,2,1) selected based on Akaike Information Criterion

Dependent variable is dLRGDP

30 observations used for estimation from 1983 to 2012

Regressor	Coefficient	St. Error	T-Ratio [Prob]
dLRGDP1	.22167	.16173	1.3707[.187]
dLHC	.22838	.060160	3.7962[.001]
dLREMG	-.053965	.016138	-3.3440[.004]
dLREMG1	-.090391	.022963	-3.9364[.001]
dLGFCFG	.12945	.068906	1.8786[.077]
dLLF	1.9587	.76418	2.5631[.020]
dLGCEG	.32558	.074658	4.3610[.000]
dLGCEG1	.13627	.055806	2.4418[.025]
dLM2	-.30721	.11114	-2.7641[.013]
dC	-17.5111	11.4256	-1.5326[.143]
dT	-.054912	.022413	-2.4500[.025]
ecm(-1)	-.54235	.094803	-5.7208[.000]
R-Squared .89153	F-stat. F(11, 18)	10.4602[.000]	
R-Bar-Squared .77530	DW-statistic	2.3405	

Source: Microfit 4.1 output

Unlike the long run model, in the short run remittance as a share of GDP has significant but negative effect on output growth for the period under consideration. The negative

impact of remittances on output is interesting, indicating that remittances are countercyclical flows in the short run. Remittances are mainly used for consumption smoothing in the short run, as it is obvious that most of the remittance recipients' families are known by their very nature of consumption volatility. This result is similar to the study by Qayyum *et al.*, (2008) and, Waheed and Aleem (2008) both in the case of Pakistan as well as the study conducted by World Bank (2010b) in the case of remittance receivers in Ethiopia, where about 60% of remittance income received by households is meant for daily consumption.

Similar to the long run outcome, both gross fixed capital formation and labour force are statistically significant and positively affecting output, though the first is significant at 10 per cent level of significance (with t -value of 0.77). Despite that, the elasticity coefficient of gross fixed capital formation as a share of GDP is by far less in the case of the short run, which is 0.12 versus 0.54 in the long run. The same holds true for the elasticity of labour force. In particular, a 10 percent increase in labour force boosts output by 1.9 percent in the short run compared to 3.6 percent increment in output in the long run. The reason behind could be due to the adaptation of workers towards the working set up or the association of workers with physical capital gets better and better as time passes on. In other words, workers will learn more on how to work with machineries and increase their productivity through time, which makes the long run elasticity to be higher.

An interesting and unexpected result from the short run model is the positive sign of government consumption expenditure including its one period lag, which are both significant. The explanation behind this result might be the short run government

consumption expenditure could be used on consumption items which have a multiplier effect in boost aggregate demand and output. The negative and statistically significant coefficient of money supply in the short run is in similar sign to that of the long run. The only difference is in magnitude (the short run impact is somewhat higher in terms of elasticity: -0.3 versus -0.22 in the long run) and money supply is insignificant in the long run compared to its significance at 5% in the short run. Here also, there is sufficient time span for authorities to recognize the inflationary impact of the money supply and hence it is possible to take appropriate actions in the long run, rather than being in very limited time duration in the short run.

Regarding the short run model's goodness of fit, as the table 5.6 shows, the regression result imply that real gross domestic product is moderately explained by the explanatory variables incorporated in the model. The adjusted R-squared (R-Bar-Squared) reveals that 77% of the short-run variation in real gross domestic product is explained by the explanatory variable. The adequacy of the model is also indicated by the F-statistic, which is significant at 1% level of significance.

Table 5.6 further indicates that, the error correction coefficient *ECM* (-1) has negative sign and statistically significant indicating that there is evidence of cointegration. The estimated coefficient for the error correction term is -0.54 showing that there is relatively moderate speed of adjustment to the long run equilibrium after the short run shock has been occurred. Therefore almost half of the disequilibrium caused by shocks in the previous period converges to the long run equilibrium.

As implied by Chandran *et al.*, (2010) and cited in Tsadkan, (2013), the long run effect can be captured by ECM term. Therefore, it can be concluded that in the long run LHC, LREMG, LGFCFG, LLF, LGCEG, and LM2 granger cause LRGDP. This further confirms causality run interactively through ECM from the explanatory variables to LRGDP. The following table shows the results from Granger Causality test.

Table 5.7 Granger Causality Test Results

Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
LREMG does not Granger Cause LRGDP	30	9.36226	0.0009
LRGDP does not Granger Cause LREMG		1.94973	0.1634

Source E-views 7.2 output result

As the outcome of the granger causality test shows, there is unidirectional causality between remittance and economic growth. This is because we reject the null hypothesis of LREMG does not Granger Cause LRGDP at 1% level of significance (0.0009 less than 0.05). However, since the probability (0.1634) is greater than 0.05, we fail to reject the null hypothesis of LRGDP does not Granger Cause LREMG in the second scenario which means that there is no causality which runs from LRGDP to LREMG.

An alternative way to check for the causality is using the ECM model. In this case, one has to first check the presence of long run relationship between the two variables (LRGDP and LREMG, in this case) using F-statistic. If the long run relationship is assured with the F statistic, the ECM should be statistically significant to conclude the existence of causality that runs from the independent variable to the dependent variable.

Table 5.8 Estimated Long Run Coefficients for test of Causality

ARDL (1,1) selected based on Akaike Information Criterion

Dependent variable is LRGDP

30 observations used for estimation from 1983 to 2012

Regressor	**Coefficient**	**St. Error**	**T Ratio (Prob)**
LREMG	0.72783	0.25379	2.8679[.008]
C	27.6820	1.7778	15.5713[.000]

Source Microfit 4.1 output result

The long run relationship can be established when LREMG is independent variable, as the calculated F statistic (9.5142) is greater than the Narayan (2004) upper bound critical value (6.305) [11]. This, however, is not the case when one models LRGDP on LREMG as explanatory variable, which we cannot formulate a causality relationship that goes from LRGDP to LREMG. After running the ECM of the above equation, where LREMG is used as the only explanatory variable, the test of causality based on the ECM representation of the above model confirms that there is uni-directional causality running from LREMG to LRGDP during the sample period.

[11] The diagnostic test result of the long run model and the short run model result are omitted here for the sake of relevance and space constraint. The diagnostic test result indicates that the model does not suffer from serial correlation [0.381], no omitted variable problem [0.382], the residuals are normally distributed [0.066] and no heteroscedasticity problem [0.076], where the figures in parenthesis indicate the calculated probabilities based on LM version.

Table 5.9 Test of Causality Based on ECM

Dependent Variable	Direction of Causality	F Stat	T Ratio on ECM
LRGDP	LREMG to LRGDP	9.5142***	-1.7797*

Source: Microfit 4.1 output

Therefore, both approaches had confirmed that there is uni-directional causality that runs from LREMG to LRGDP, but not from LRGDP to LREMG. This implies that, remittances do lead to greater output but not vice versa. More remittance inflow results growth in output but growth in output at home does not attract more remittances.

CHAPTER SIX

CONCLUSION AND POLICY IMPLICATIONS

6.1. Conclusion

Economic growth has been one of the overriding issues among the macroeconomic objectives of developing countries. In their attempt to attain continuous and broad based growth, governments of these countries have been implementing various macroeconomic policies, by identifying the potential determinant factors for growth.

The growth literature had identified various determinant factors for growth, the attention given to remittance, however, being very minimal. This is despite the growing flow of this finance to developing countries in general and Ethiopia in particular in association with the huge migrant stock all over the world. Besides, the diverse channels through which remittance can affect growth had let to the difficulty of identifying its impact theoretically, which made the issue to be an empirical one.

In this study, an attempt is made to analyze the role of international remittance on economic growth using time series data ranging from 1981 to 2012. The data for the study is obtained from World Bank development indicators data base and MoFED. The econometric part of this study had employed the more recently developed autoregressive distributed lag model or bound test approach. The small sample size of the data and the mixed order of integration of the variables under the study are the justifications for applying this model. The model is adopted to investigate the existence of short run and long run relationship between LRGDP which is used as dependent variable and LHC, LREMG, LGFCFG, LLF, LGCEG and LM2 which are the independent variables.

The descriptive part in chapter four has revealed that the amount of remittance sent to Ethiopia started showing a tremendous trend since 2003, with a slight decline in 2009 and an immediate recovery in the following year. In terms of remittance as a percentage of GDP, however, it could not exceed 2 per cent. Moreover, North America is found to be the major source of remittance.

The result of the econometric analysis indicated that there is a long run relationship between economic growth and the explanatory variables. It is also found that LHC affects economic growth positively and significantly both in the short run and long run, which is in line with the theoretical foundation. Regarding LREMG, the result confirmed that it affects growth positively and significantly in the long run. Nonetheless, the impact is negative for the short run model. This is due to the consumption smoothing target of remittance income by receiving households in the short run. On top of that, the causality test applied had showed that there is uni directional causality which runs from LREMG to LRGDP.

LGFCFG and LLF have also found to positively and significantly affecting growth both in the short and long run. In line with the theory and due to unproductive nature of the spending, LGCEG affects growth negatively and significantly in the long run. However, the short run effect is positive, which was unexpected result of the study. Finally, the result of the study have revealed that LM2 have negative impact on economic growth, which can be explained by the high possibility of money supply to result in inflationary situation under poor macroeconomic management.

6.2. Policy Implications

Based on the findings of the study, the following policy recommendations are forwarded to the government and any other concerned stakeholders.

In particular to the remittance, as the study showed it has a positive role in promoting growth in the long run. Hence, in order to sustain this role the issue is that the financial sector should be further modernized in terms of remittance products provided and through branch expansion in addressing wide range of customers. Moreover, government, banks, and remittance service providers should work collaboratively in diverting the remittance flow through the informal channel towards the formal way, through decreasing the cost of sending, so that the economy will be able to extract the benefit remittance to economic growth in a better way.

The education sector should be further strengthened both in terms of coverage and quality. This is because; the output of the sector has a direct implication in human capital formation and hence economic growth. Regarding the role of government consumption expenditure on economic growth, the spending should be restructured, directed to priority areas even if it is consumption, or switched towards areas such as infrastructure, as the consumption spending is found out to be growth retarding.

In relation to the impact of money supply on economic growth, the negative association should be critically examined, as huge money supply could result in inflationary situation in the economy. Specifically, government should look for alternative financing mechanisms such as broadening tax base which is not inflationary as well as could be used as source of revenue.

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APPENDICES

Appendix 1: Regression Result for the Test of Long Run Relationship

```
                    Variable Addition Test (OLS case)
*****************************************************************************
 Dependent variable is DLRGDP
 List of the variables added to the regression:
 LRGDP(-1)       LHC(-1)         LREMGDP(-1)     LGFCFGDP(-1)    LLF(-1)
 LGCEGDP(-1)     LM2(-1)
 29 observations used for estimation from 1984 to 2012
*****************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPUT                     -9.7474            19.0351           -.51208[.627]
 T                        -.052943            .039457           -1.3418[.228]
 DLRGDP(-1)                -.15552             .14303           -1.0873[.319]
 DLRGDP(-2)                -.59469             .20609           -2.8855[.028]
 DLHC(-1)                 -.011586            .066901           -.17318[.868]
 DLHC(-2)                 -.081771            .066442           -1.2307[.264]
 DLREMGDP(-1)              -.15562            .038093           -4.0854[.006]
 DLREMGDP(-2)              -.11495            .033114           -3.4715[.013]
 DLGFCFGDP(-1)             .011916             .13789           .086418[.934]
 DLGFCFGDP(-2)             .039898            .077294            .51618[.624]
 DLLF(-1)                  .034723             .74788           .046428[.964]
 DLLF(-2)                  -.32713             .75246           -.43475[.679]
 DLGCEGDP(-1)               .33132             .12177            2.7208[.035]
 DLGCEGDP(-2)               .29741            .070388            4.2253[.006]
 DLM2(-1)                  -.32850             .10055           -3.2669[.017]
 DLM2(-2)                 .0045957            .097821           .046981[.964]
 LRGDP(-1)                 -.79266             .16547           -4.7902[.003]
 LHC(-1)                    .26597            .096504            2.7561[.033]
 LREMGDP(-1)                .12003            .024846            4.8311[.003]
 LGFCFGDP(-1)              .034766             .15570            .22328[.831]
 LLF(-1)                    1.6657             1.3656            1.2198[.268]
 LGCEGDP(-1)               -.19687            .049619           -3.9676[.007]
 LM2(-1)                   .038284             .10800            .35449[.735]
*****************************************************************************
 Joint test of zero restrictions on the coefficients of additional variables:
 Lagrange Multiplier Statistic     CHSQ( 7)=  26.5171[.000]
 Likelihood Ratio Statistic        CHSQ( 7)=  71.2786[.000]
 F Statistic                   F(  7,   6)=   9.1543[.008]
*****************************************************************************
```

Appendix 2: Diagnostic Test Results for Long Run Model

```
                              Diagnostic Tests
*****************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*****************************************************************************
*                     *                          *                            *
* A:Serial Correlation*CHSQ(   1)=   3.0723[.080]*F(   1,  13)=   1.4832[.245]*
*                     *                          *                            *
* B:Functional Form   *CHSQ(   1)=   3.8582[.050]*F(   1,  13)=   1.9187[.189]*
*                     *                          *                            *
* C:Normality         *CHSQ(   2)=   .38686[.824]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)=  .019704[.888]*F(   1,  28)=  .018403[.893]*
*****************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

Appendix 3: Long Run Auto Regressive Distributed Lag Estimation Result

Estimated Long Run Coefficients using the ARDL Approach
ARDL(2,0,2,1,0,2,1) selected based on Akaike Information Criterion

Dependent variable is LRGDP
30 observations used for estimation from 1983 to 2012

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LHC	.42110	.086476	4.8695[.000]
LREMGDP	.11931	.038409	3.1062[.008]
LGFCFGDP	.54750	.19777	2.7684[.015]
LLF	3.6114	1.4294	2.5265[.024]
LGCEGDP	-.046788	.072690	-.64366[.530]
LM2	-.22893	.15388	-1.4877[.159]
INPUT	-32.2871	21.7196	-1.4865[.159]
T	-.10125	.042137	-2.4028[.031]

Appendix 4: Error Correction Representation Estimation Results

Error Correction Representation for the Selected ARDL Model
ARDL(2,0,2,1,0,2,1) selected based on Akaike Information Criterion

Dependent variable is dLRGDP
30 observations used for estimation from 1983 to 2012

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dLRGDP1	.22167	.16173	1.3707[.187]
dLHC	.22838	.060160	3.7962[.001]
dLREMGDP	-.053965	.016138	-3.3440[.004]
dLREMGDP1	-.090391	.022963	-3.9364[.001]
dLGFCFGDP	.12945	.068906	1.8786[.077]
dLLF	1.9587	.76418	2.5631[.020]
dLGCEGDP	.32558	.074658	4.3610[.000]
dLGCEGDP1	.13627	.055806	2.4418[.025]
dLM2	-.30721	.11114	-2.7641[.013]
dINPUT	-17.5111	11.4256	-1.5326[.143]
dT	-.054912	.022413	-2.4500[.025]
ecm(-1)	-.54235	.094803	-5.7208[.000]

Declaration

I, the undersigned, declare that this project paper is my original work and has not been presented for Masters Degree in any other university, and that all sources of materials used here have been duly acknowledged.

Declared by:

Name: Mikias Tilahun Kifle

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Confirmed by (Advisor)

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Place and date of submission: Addis Ababa/Oct 2014