The Contribution of Migrant Remittance on the Economic Growth of Ethiopia: An Autoregressive Distributed Lag Approach

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A Thesis Submitted to the Department of Economics

Presented in Partial Fulfillment of the Requirements for the

Degree of Masters of Science in Economics (Development Economics)

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Addis Ababa University

Addis Ababa, Ethiopia

June, 2020

Addis Ababa University

School of Graduate Studies

This is to certify that the thesis prepared by Binyam Tadele Gebereyesus, entitled: *The Contribution of Migrant Remittance on the Economic Growth of Ethiopia: An Autoregressive Distributed Lag Approach* and submitted in partial fulfillment of the requirements for the Degree of Masters of Science in Economics (Development Economics) complies with regulations of the University and meets the accepted standards with respect to originality and quality.

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ACKNOWLEDGEMENT

It has been such a long journey pursuing this master's programme and I am grateful to the almighty God and his mother Mariam for this far I have come. To start with I would like to thank Addis Ababa University and the Department of Economics for accepting me as a student. I also want to express my profound gratitude to our coordinator Mr. Kebede Bekele (INS); I deeply appreciate your kindness. My sincere thanks go to my mother Girmanesh Shiferaw and my father Tadele Gebereyesus who has been by my side through the ups and downs of life. The assistance provided by Bihonegn Fengta (INS) was greatly appreciated through all my study. I would also like to express my heartfelt gratitude to my beloved ones Sara T, Desta N, Yebelay G, Zerihun B, Zelalem M, Neshwa M, Ermias T(INS), Tsgereda W and Amanuel T who in diverse ways assisted me for the successful completion of this study. Last but not least, I am grateful to my entire family and friends for their diligent support and encouragement during this project work and their constant motivation to me to keep on.

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List of Acronyms

ACF Auto-Correlation Function

ADF Augmented Dickey-Fuller

AIC Akaike Information Criterion

ARDL Autoregressive Distributed Lag

DF Dickey-Fuller

ECM Error Correction Model

FPE Final Prediction Error

GDP Gross Domestic Product

GMM Generalized Method of Moments

HQ Hannan-Quinn Information Criterion

ILO International Labour Organization

IMF International Monetary Fund

IOM International Organization for Migration

IRF Impulse Response Function

LAC Latin American Countries

LR Likelihood Ratio

MENA Middle East and North African

NBE National Bank of Ethiopia

NELM New Economics of Labour Migration

OLS Ordinary Least Squares

PP Phillips-Peron

RGDP Real Gross Domestic Product

SIC Schwarz Information Criterion

UNDP United Nations Development Program

WB World Bank

Abstract

Scholars in different counties characterized the impact of remittance on economic growth differently. The optimist view agreed in that remittance has a positive effect on the remit receiving country through stimulating the economic growth. However, the pessimist view argued that remittance shouldn't encourage the economic growth; rather it holds back the economy through increasing dependency on the foreign by remit receiving countries. The general objective of the study is to assess the relationship between remittance and economic growth in Ethiopia, Autoregressive Distributed Lag model approach was used to evaluate their interdependencies. The adopted model is applied to investigate the existence of short run and long run relation between the dependent and independent variables. The data used is collected from Nation Bank of Ethiopia, Ministry of finance for economic development and World Bank Development Indicators; which spans from 1984 up to 2018. The finding revealed that remittance affects economic growth positively and significantly both in the short run and in the long run. On top of that other independent variables in the model do not have a strong influence on real gross domestic product in the short run. Whereas, in the long run the forecast error variance in real gross domestic product is explained by a strong influence in predicting real gross domestic product. The most important policy implication that comes out of this study is that the government as well as other concerned party should work on easing the remittance sending process and cost, so as to better extract and benefit from the hard currency which the country relay on.

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

CHAPTER ONE

1. Introduction

1.1 Background of the Study

The migrant remittance market has been grown dramatically in many parts of the world for the last two decades. However, its critical contribution in the economic growth is not widely known and acknowledged in the field of economics, finance and related academic studies. In fact, by traditional assumption the importance of migrant remittance in economic growth is undeniable. Remittance services have provided lifeline for the majority of poor households. In other words, both needy families and individuals in urban and rural localities in Ethiopia receive vital small amounts of money sent by their relatives from abroad to support their families back home, where most of them suffered from poverty and low income.

It is a common act that Ethiopian's who live abroad were remitting some of their salary back to their families. However, migrants from Ethiopia used to remit to their families or relatives either via bank transfers or sending it via messengers. Nowadays, the traders and their agents would collect money from those migrants to deliver to their families. This process might exclude the government to get hard currency, which might have a direct negative effect on the economic growth of the country.

Migrant remittance is not a new topic to be researched. There are lots of literatures that focuses on the issue, yet not capture the overall size and impact of remittances associated with the cross-border movements (Ghosh, 2006). According to the World Bank1, remittances flows to the developing world have reached USD 414 billion in 2013 (up 6.3 per cent over 2012), and are now, behind foreign direct investment, the second largest source of external financial flows to developing countries.

In some States, remittances are equivalent to more than three times the official development assistance and can have profound implications for human welfare and

economic growth. Given the 232 million international migrants and almost 700 million internal migrants, the earnings generated and transferred by migrants are projected to reach USD 540 billion by 2016. Out of this Ethiopia received remittance USD 387 million in the same year (World Bank Group 2013). This indicates that diffusing remittance money has remained one important stream of revenue for the governments and peoples of developing countries. Over 192 million migrants across the world actively remit their money back to their country of origin. Therefore, the relationship between these variables takes the center of attention on both industrial and developing countries.

A report by the National Bank of Ethiopia (NBE, 2011) was astonishing. That states the amount of remittance sent to the Nation by the Diaspora community was exceeded the export revenues obtained during the same period for the first time. Hence, the role of migrant remittance on economic growth has been interesting issue.

1.2 Statement of the Problem

Nowadays, individuals are migrating particularly from developing countries to the developed one seeking better economic privileges for themselves and their families. Once the migrant secured employment abroad, they began to remit their families back home.

There are many researches done on the relationships between remittance and economic growth but the empirical evidence is not that much clear with respect to our Nation. Traditionally there is an assumption that indicates remittance has insignificant influence on economic growth.

Similarly, Ethiopia can also be categorized under one of the Sub-Saharan countries struggled with food insecurity, political instability, unemployment and ethnic conflict. Due to such challenges, there is a high migration of human resource to the abroad countries particularly to the developed countries like Europe, North America, Arab countries, etc. From 1980s, onward Ethiopia is one of the largest countries contributing to the migrant flows to developed countries.

On the other hand, migrant remittances to Ethiopia provide an integral source of income for their families. The United Nations Development Program (UNDP) stated that the total remittance flow of Ethiopian in 2007 was about USD 359 Million. This indicates that the average value of remittances per individual was about USD 4.00. However, the relation between migrant remittances and economic growth is not that much empirically studied in Ethiopian context.

Considering the above arguments, this topic is not well addressed in Ethiopian context. Therefore, this research examines that the contribution of remittance on the economic growth of Ethiopia using both quantitative and qualitative methods of data analysis and the relationship between them by using time series data from 1984 up to 2018. The econometric method employs Autoregressive Distributed Lag (ARDL) technique.

1.3 Research Question

This study answered the following research questions:

1. What is the relationship between economic growth and remittance? If there is relation, to what extent?
2. What are the trends of remittance in Ethiopian economy?

1.4 Objective of the Study

The general objective of this study is to investigate the relationship between remittance and economic growth of Ethiopia and if there is any significant impact from shocks using ARDL model.

More specifically, the study tries

1. To examine the relationship between remittance and economic growth.
2. To investigate the trends of remittance in Ethiopian economy.

1.5 Significance of the Study

It is obvious that majority of the migrants are sending remittance for families. The aim of this study is examining the contribution of remittances on economic growth in general and particularly in Ethiopia and proposing recommendations for sustainable development. Thus, this study contributes significantly to the existing literature through providing recent evidence on remittance – economic growth relationship in Ethiopia using ARDL model.

1.6 Scope of the Study

Although the study peaks a vast topic in the macroeconomic policy, i.e. the contribution of migrant remittance on the economic growth of Ethiopia it focuses on the role of remittance on economic growth. Apparently there are many factors that affect performance of economic growth; some are positive some are negative. Out of these migrant remittances plays a critical role by altering the level of economic growth. Thus the study focuses more on migrant remittance and it covers the time period from 1984 to 2018.

1.7 Limitation of the Study

The study broadly explores the effect of remittances on the growth of an economy, but has not narrowed down to examine the welfare effects of these remittances. Welfare is important in Ethiopia, as it can indicate the categorical importance of an economic growth. The other limitation of this study is that it only uses formal records of remittances omitting informal remittances that are not captured in government records which could be high enough to alter the result of this study.

1.8 Organization of the Paper

This thesis has five chapters. After the above introduction, chapter two provides a review of theoretical and empirical literature related to remittance and its linkage between the economic growths. The data types and sources, model specification and estimation techniques are discussed in the third chapter. Chapter four reports the results of the empirical analysis and the last chapter deals with conclusion and recommendation part.

1.9 Justification of the study

Policy makers and academics have broadly discussed the impact that a remittance has on economic growth. More research on this subject is still needed despite the broad exploration of the subject in order to reach a global understanding associated with the appeal of remittances for the growth of the economy. Thus the logic for this research is to figure out the contribution of remittance from Ethiopians abroad on the country‟s economic growth.

CHAPTER TWO

2. 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 foreign 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 the one who gains from migrant 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 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 assessing 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 important factors 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.

2.1.3.1 Microeconomic Determinants

Lucas and Stark (1985) have identified 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). The first 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 remit 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).

2.1.3.2 Macroeconomic Determinants

Apart from the microeconomic motives of sending remittance, also other factors 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 be more need for remittances.

2.2 Review of Related Literature

2.2.1 **Definitions and Conceptual Frame Work On Remittance**

As World Bank (2006) defined the remittance as broadly defined here as cross-border person-to Person payments of relatively low value. In order to compile and report remittances data, institutions adopt specific definitions of what constitutes a remittances

transfer. World Bank Migration and Remittances Fact book (2010) defined as remittances as the sum of workers' remittances, compensation of employees, and migrants' transfers. While these are three different series, this publication suggests that compliers of data are not good at distinguishing between these series and tend to mix them. The concepts of remittance had been linked to the theory of migrations. Its definition however can be linked to its motives, effects, uses, kind of transfer and the channel of fund transfers. IOM (2006) broadly defined remittances as the financial flows associated with migration, in other words, personal cash transfers from a migrant worker or immigrant to a relative in the country of origin. ILO (2000) the portion of migrant workers' earnings sent back from the country of employment to the country of origin.

Actually, remittances defined as Workers' remittances: Current private transfers from migrant workers who are considered Residents of the host country (i.e. non-residents of the home economy) to recipients in the workers' country of origin. If the migrants live in the host country for one year or longer, they are considered residents, regardless of their immigration status. Compensation of employees: Earnings by resident individuals (i.e. Residents of the home economy) for work performed in another economy (i.e. working in host) and paid for by residents of this other economy. If the migrants have lived in the host country for less than one year, their entire income in the host country is classified as compensation of employees. Migrants' transfers: The net worth of migrants' assets that are transferred from one country to another at the time of migration (for a period of at least one year). This includes the flow of goods and changes in financial items that occur with migration (to or from the migrant as resident to the same person as non-resident.

Channels of Remittance Transfer are away of remittance flow from abroad to home countries and it is categorized as the formal Channel: Where transactions go through the formal financial system and are documented. e.g. through banks, MTOs, Post offices using traveler's cheques, telegraphic transfers, postal orders, account-to-account transfers etc. whereas the Informal Channel: Transactions may or may not go through the formal channel, and documented for formal use, it refers to the transfer of funds outside the

international or national legal foreign exchange transfer frame work e.g. Hawala, Hindu, source, world development indicators (2006).

2.2.2 **Remittances as a Social Insurance**

Evidence from around the globe suggests that recipient households generally have higher levels of consumer spending and lower incidences of extreme poverty than their counterparts who do not receive remittances. Ratha (2013) argues that remittances could play a key role as a „powerful antipoverty force" because they tend to increase the incomes of households in the developing world. A recent study on Moldova (Stratan et al., 2013) found that remittances contribute to reducing the severity of poverty8, as migrants" relatives directly receive remittances. Adams and Cuechuecha (2010) indicate that international remittances have the greatest impact on reducing the depth and severity of poverty, rather than on reducing its scale. Analyzing 71 developing countries, Adams and Page (2005) found a relationship between remittances and poverty reduction, statistically demonstrating that a 10 per cent increase in international remittances from each remitter will lead to a decrease of 3.5 per cent in the share of people under poverty. Similarly, Anyanwu and Erhijakpor (2010), who analyzed remittance flows for a sample of 33 African countries for the period 1990–2005, found that the depth and severity of poverty were declining.

Furthermore, research reveals that remittances are often part of the risk-spreading strategies of households and arise as a „social insurance" in countries affected by economic and political crises (Kapur, 2003), reinforcing the households" capabilities to resist external shocks. Egypt is a good example of how migrants provided for their families when political instability struck the country during the Arab Spring. Investors (foreign direct investment) and donors (official development assistance) were pulling out while remittances inflows to Egypt increased between 2009 and 2011. Recently, households in Mali have also started to save a substantial portion of remittances for unexpected events, providing a private safety net for the migrant"s family.

Most critically, migration and remittances are not accessible to all needy populations. Not all poor or vulnerable households have the initial capital needed to migrate. Indeed, the costs and risks associated with migration are barriers for the poorest people (World Bank, 2011; Stark et al., 1988). Often selective and expensive, international migration is generally associated with flows of migrants to developed countries where immigration regimes tend to be more restrictive (De Haas, 2007). Consequently, the unlikeliness of the poorest migrating internationally may interfere with their ability to remit. In this sense, migration seems to increase inequality (Adams, 2011), not only between international and internal migrants, but also between migrants and non-migrants.

2.2.3 **Remittances as a Means for Investment**

Numerous household surveys reveal that recipient households make relatively higher investments in health care than those who do not receive remittances. This is evidenced by, for example, recipient households having higher birth weights (e.g. in Mexico and Sri Lanka), lower rates of infant mortality, higher weight levels during early childhood, and higher health-related knowledge than other households that do not receive remittances (Hildebrandt and McKenzie, 2005; UNDP, 2009; Prabal and Ratha, 2012).

When it comes to the effects of remittances on education in origin countries, findings suggest that migration and remittance inflows can positively add value to the local human capital and ensure greater school attendance and educational achievement (De Haas, 2007). A cross-country comparison of six sub-Saharan African nations shows a strong, positive correlation between the average number of household members with a secondary education and the receipt of international remittances (Ratha, 2013). According to Mara et al. (2012), remittance inflows tend to reduce the liquidity constraints of households, allowing them to increase educational expenditures. This is, for instance, the case in the Philippines (Yang, 2004). Adams and Cuecuecha (2010b) also found that households in Guatemala receiving internal and international remittances spend 45.2 per cent and 58.1 per cent, respectively, more on education than do non-remittance households. As stated by De Haas (2007), such long-term investment of remittance inflows for education are of

high interest because they function as insurance strategies for households and families that do not have access to formal social security arrangements.

Remittances are believed to further allow migrants‟ households to build their assets, both liquid (cash) and fixed (property), enhancing access to financial services and investment opportunities (Orozco et al., 2005; IMF, 2005). In the Philippines and Mexico, for example, research suggests that remittance inflows are associated with a greater accumulation of assets in farm equipment, higher levels of self-employment and increased small-business investments in migrant-sending areas.

2.2.4 **Remittances' Impacts on National Economic Growth**

Some empirical studies (Solimano, 2003; World Bank, 2006) suggest that remittances may have the potential to positively affect a country‟s economic growth. A group of studies (Aggarwal et al., 2006; Giuliano and Ruiz-Arranz, 2005) also confirm the significant positive impact of remittances on both bank deposits and bank credit to the private sector. They argue that remittances act as substitutes to other financial means such as credit and insurance, which do not necessarily exist in developing countries. Stimulating consumption and investment, remittances may have the potential to reduce the size of a recession in certain countries and to boost the local economy. Outside of the normal day to- day consumption, remittances could possibly allow households to engage in more profitable economic and high-risk activities. Recently Ratha (2013) reports that remittances raise domestic savings and improve financial intermediation, which could in turn, improve the growth prospects of the origin countries. Correspondingly, Yasseen (2012) shows a positive correlation between remittances and the development of financial systems in developing or emerging countries, mostly in the Middle East and North Africa.

Nevertheless, these positive views of remittance impacts, evidence of remittances potential to sustain national economic growth or employment seems to be inconclusive. For example, Stratan et al. (2013) show that even in the case of Moldova, where

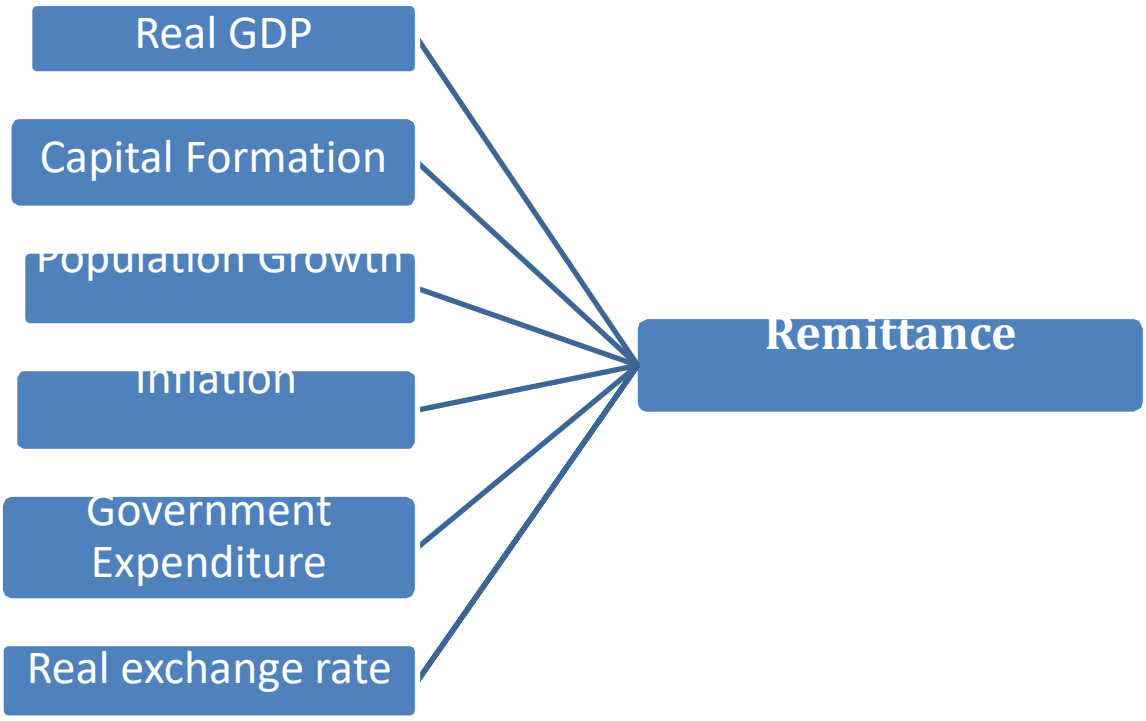
remittances varied from 14 per cent to 19.1 per cent of GDP between 2006 and 2011, the correlation between remittance incomes and national growth is still ambiguous. While Barajas et al. (2012) argue that the volume of remittances may vary depending on the economic downturns in sending countries; Giuliano and Ruiz-Arranz (2005) find remittances impact positively on GDP growth when the financial markets are relatively underdeveloped.

2.2.5 **Remittances as a Source of Revenue for Local Government**

The International Monetary Fund (IMF) and the World Bank (2009) recognize the benefits of remittances as a stable and countercyclical source of external financing when assessing how much debt low-income countries could safely handle. Being able to borrow more when receiving a high amount of remittances, States could use the extra borrowing power to fund investments, which may promote national economic growth. In fact, the World Bank–IMF Debt Sustainability Framework launched in 2009 is allowing recipient countries to carry higher levels of debt when the ratio of remittances is higher than 10 per cent of their domestic income and 20 per cent of exported goods and services.

On the other hand, Chami, Montiel et al. (2012) have found that remittances can damage the quality of States‟ institutions in recipient countries precisely because they tend to increase the ability of governments to have more or less expenditures without clearly showing the full cost of government actions. In a cross-section analysis of 111 countries, they empirically verify that an increase in remittances can lead to a deterioration of institutional quality (e.g. corruption). Remittances may expand the share of funds grabbed by the government for its own purposes.

Conceptual Framework



2.3 Remittance-Growth Linkage: An Empirical Review

There is an argument 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 has 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 has 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 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 remittance increases and improve credit constraints for those who have lower income, by improving the allocation of capital, substitute the lack of financial development and thus accelerate economic development. 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.

However, Barajas *et al.* (2009) indicated that when there is a higher integration of economy with world financial markets, and the more likely to develop the domestic financial system, the lesser it is that migrant remittance receipts will rouse investment by reducing 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. 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.

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 migrant remittance has negative impact on growth in per capita incomes. They recognized three conventional facts; the first one is significant proportion of remittances is spent on consumption. The second one is that smaller part of remittance goes to saving or investment. The last factor is the ways in which migrant remittances are typically saved or invested like housing, land and jewelry are not that much productive to the economy growth 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 migrant remittances weaken productivity and growth in under developing countries because they are freely spent on personal consumption most likely to be dominated by foreign good than on productive investments which can support economic growth. 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 economic growth, through the ability to alter 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 raise 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 international remittance foster the consumption capacity of rural households which might have significant multiplier effects because most likely they are used for 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) founded that real exchange rate overvaluation doesn‟t give focus the long run economic growth impact as the production of tradable goods suffers inappropriately from weak institutions and market failures, particularly for under developed countries.

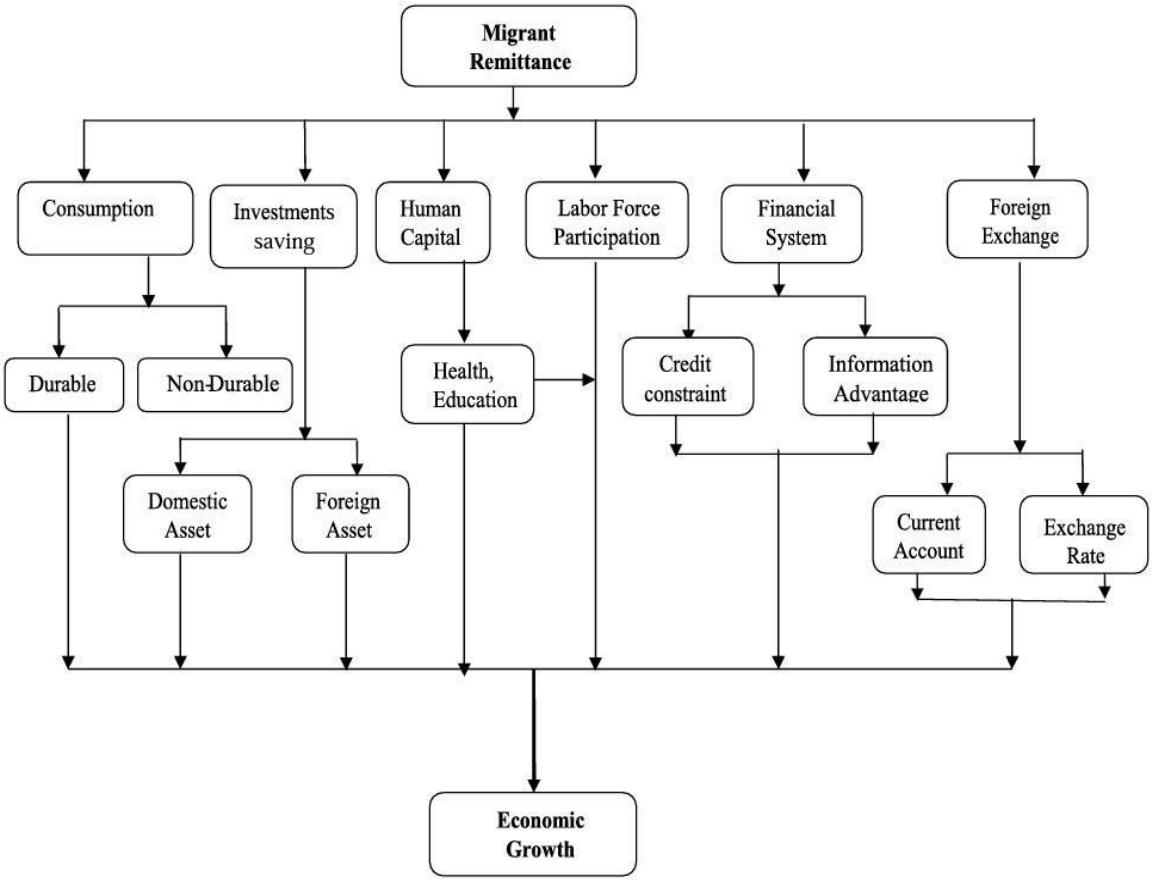
There are various empirical studies which came up with inconclusive results either in sign of relationship between remittance and growth or in significance. For instance, a study by Jawaid and Raza (2012) which investigated the relationship between remittance and economic growth in China and Korea using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

2.4 Overview of literature

The literature review on the association between economic growth and remittances of remittance receiving countries is not conclusive in responding to the study question about the effect of remittances on the growth of the economy in recipient countries. The literature has helped in identifying the motivations for remittances and has also been significant in highlighting the growth effects of other external sources of capital. This comes as a result of the clashing theories and literature on how migrant‟s funds effect the growth of the economy of remittance receiving countries.

Migration optimists observe that through improved physical and human capital investments, a positive effect from remittances is observed on growth of the economy while migration pessimists have an opposite opinion as they claim that migrant‟s funds have an effect which is negative on the growth of the economy as a result of consumption that has improved and has moral hazards and impacts that are inflationary and that brings about a reduction of labor supply and declining education enrolment. According to Fayissa and Nsiah (2010a), Fayissa and Nsiah (2010b) and Pradhan et al (2008), they conclude that there is a positive growth effect with remittances while Singh et al (2010) and Chami et al (2003) summarize that negative effects are seen on remittances. Other scholars, Barajas et al (2009) and Rao and Hassan (2011), hold the conclusion that migrant‟s funds have no effect on the growth of an economy.

There is need for further empirical research on this subject. There still is a challenge in data coverage and quality in many countries as far as observation of the part played by remittances in economies. There is no agreement that is accepted globally on how the effect of remittances in less developed countries are measured. These limitations in data are linked to informal means of channeling remittances to migrant sending countries and improper procedure of capturing remittance statistics.

CHAPTER THREE

3. Research Methodology

3.1 Data Type and Source of Data

The sample of the study was taken for the analysis over the past 35-year‟s period using the latest available data for the period 1984 to 2018. This is selected because a remittance to Ethiopia as well as economic growth seems to have increased in this period and therefore, remittances could have contributed to economic growth. Secondary data is used in the research. Data on migrant remittances is drawn from the World Bank Development Indicators; Data on real GDP, Capital formation, Inflation, Government Expenditure, Population Growth and Real Exchange Rate is accessed from NBE and MoFED.

3.2 Research Design

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 E-view version 9.1 statistical software packages. The contribution of remittances on the economic growth of Ethiopia is assessed by time series data using ARDL model.

An econometric model is used because it highlights whether a relationship exists between remittances and the growth of an economy. This approach also makes it possible for the researcher to explore whether the association between remittances and the growth of an economy is statistically significant or insignificant. Besides showing the statistical significance of the association between the economic variables, the econometric research method will also indicate whether there is a positive or negative relationship.

In addition, the level of negativity or positivity of the relationship between remittances and the growth of the economy is quantified by the design of the research. The reported coefficients will estimate how a particular change in the explanatory variables will affect the dependent variable. An empirical analysis that is detailed was significant for responding to the research questions of this study hence the major motivation for employing the methodology.

3.3 Model Specification

Where: Y is the dependent variable, economic growth. This research used real GDP as the measure for growth of an economy.

Based on the above equation, the theoretical equation set as follows for this specific study with a simple log linear Cobb-Douglass production function is:

The variables applied above in the model are as follows:

$lnRGDP_t$ is the natural log of real GDP, the value of all goods and services produced within an economy in a given period of time is used as a proxy to measure economic growth (as the dependent variable).

α is the constant

β_1, β_2, β_3, ----------, β_6 are the coefficients of regression which predisposes the independent variable‟s contribution

$lnREM_t$: - is the logarithm of remittance. It is the main independent variable of the study being a worker‟s remittances and compensation of an employee, received, expressed in log form.

$lnPCFO_t$: - represent Capital formation. The study used real investment as a share of GDP to represent investment.

$lnPOP_t$**: -** Is the logarithm of growth of the population. In this context, population growth is included as a proxy for labor supply.

$lnINF_t$: - is inflation, which is included as an indicator of macroeconomic stability. Data is presented as annual averages for inflation.

$lnGEX_t$: - is the logarithm of government consumption. It is communicated by applying data for general government final expenditure on consumption as a GDP percentage.

$lnRER_t$: - Is the weighted average of a country currency in relation to an index of other major currencies.

U_i = error term (residual) value**.**

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.

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.

Long run relationship: Co-integration

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. The asymptotic distribution of the F or Wald statistics is nonstandard 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.

Testing Causuality 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 LREM) 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.

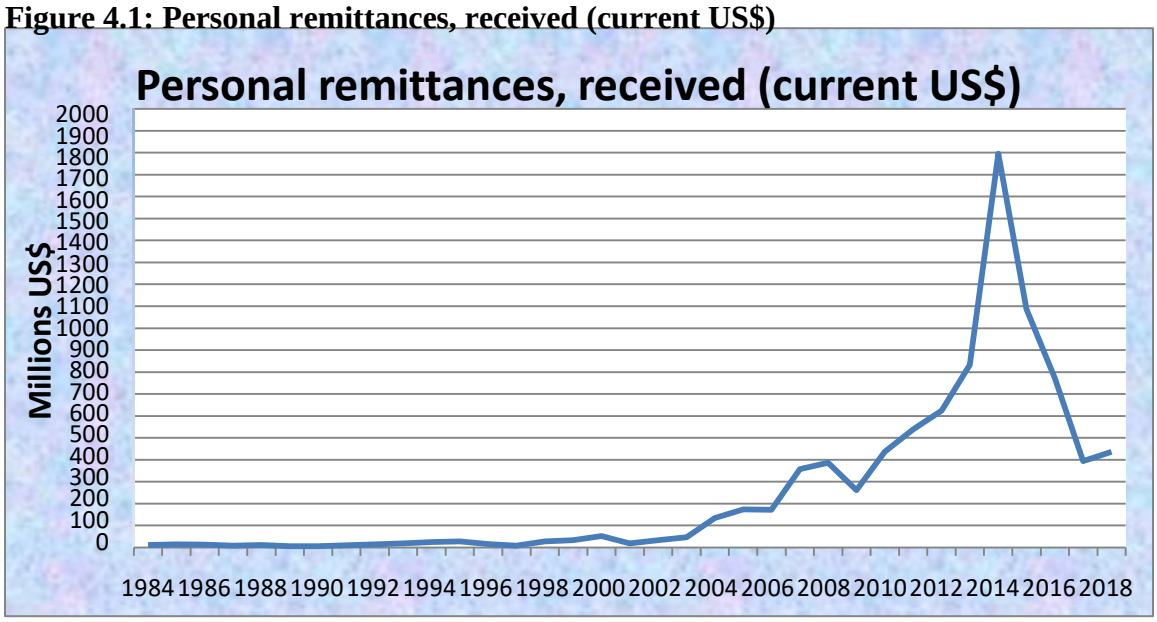
CHAPTER FOUR

4. Results and Discussions

4.1. Trends of Remittance Inflow to Ethiopia

As we can see from the below figure 4.1 the total amount of remittance inflow started to show significant increment, mainly since 2002. Between 1984 and 2003 remittance flows have steadily grown from 10 million USD to 40 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. This continuous increase, however, witnessed a slight decline in 2006 due to the global financial crisis that occurred in the western economies, which is the main source of remittance for Ethiopia.

Figure 4.1: Personal remittances, received (current US$)



Source: World Bank Indicators Database

4.2. Trends of Real GDP Growth Rate

As we can see from the below figure real GDP has been fallen to a negative rate before 2003 registering the worst number -0.36% in 1989. After that period real GDP constitute a positive number even double rate in some fiscal years.

Figure 4.2: Real GDP Growth Rate

4.3. Empirical Results for Unit Root Test

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 4.1: ADF Unit Root Test

Variable	ADF Unit Root Test in Level		ADF Unit Root Test at First Difference		I(d)
	ADF Test statistics	5% critical Value	ADF Test Statistics	5% critical Value	Order of integration
LRGDP	-4.1361	-2.9511	-4.5692	-2.9677	I(1)
LREM	-2.0767	-2.9511	-3.6063	-2.9677	I(1)
LCFO	1.30036	-2.9511	-6.8136	-2.9540	I(1)
LPOP	-3.0647	-2.9571	-7.3355	-2.9540	I(1)
LINF	-5.4025	-2.9511	-5.8622	-2.9604	I(1)
LGEX	-4.705810	-2.951125	-8.071797	-2.957110	I(1)
LRER	-1.8827	-2.9511	-5.3251	-2.9540	I(1)

Table 4. 2: PP Unit Root Test

Variable	PP Unit Root Test in Level		PP Unit Root Test at First Difference		I(d)
	PP Test statistics	5% critical Value	PP Test Statistics	5% critical Value	Order of integration
LRGDP	-4.070790	-2.951125	-10.68560	-2.954021	I(1)
LREM	-2.076772	-2.951125	-6.586922	-2.954021	I(1)
LCFO	1.624497	-2.951125	-6.656113	-2.954021	I(1)
LPOP	-3.393968	-2.951125	-7.145111	-2.954021	I(1)
LINF	-5.411238	-2.951125	-23.30238	-2.954021	I(1)
LGEX	-4.717469	-2.951125	-17.86000	-2.954021	I(1)
LRER	-1.712757	-2.951125	-5.547783	-2.954021	I(1)

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. 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.

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 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 bounds of Narayan (2004) critical values, based on the rational mentioned in chapter three. 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.

Critical values: Intercept & trend (Case III)	Pesaran *et al* (2001); k=6		Narayan (2004); k=6, n=35	
	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.

Table 4. 3: Granger Causality/ Block Exogenity Wald Test

Granger Causality/ Block Exogenity Wald Test			
Dependent variable: GDP			
Excluded	**Chi-sq**	**Df**	**Prob.**
LREM	2.539755	2	0.2809
LCFO	0.033741	2	0.9833
LPOP	0.022830	2	0.9886
LINF	4.356628	2	0.1132
LGEX	5.712790	2	0.0575
LRER	0.076744	2	0.9624
All	26.98155	12	0.0078

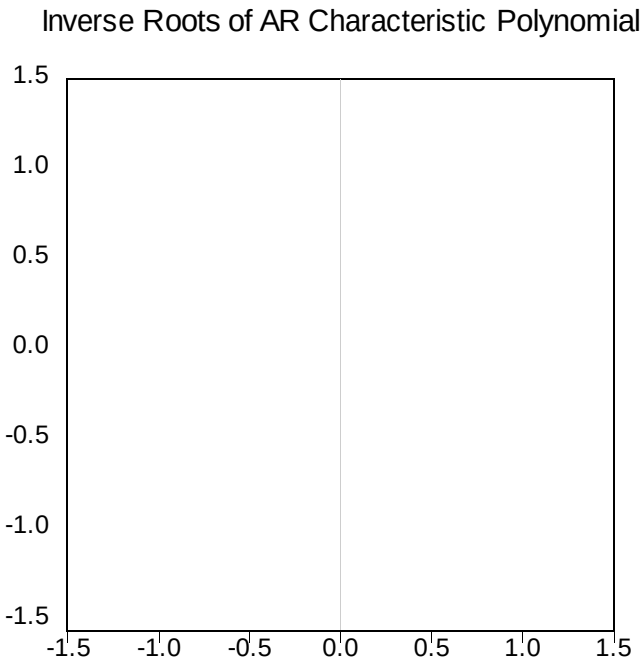
The weak exogeneity test in the table indicates that the value of real GDP endogenous (dependent) in the estimated value of economic model since the null hypothesis of weak exogeneity is rejected at 5% level of significance. Therefore, the LRGDP series can be a long run co integrating equation. In addition, the rejection of the null hypothesis that RGDP is weakly exogenous indicates that the existence of a significant long-run stationarity feedback to dependent variable.

4.2.3. 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.

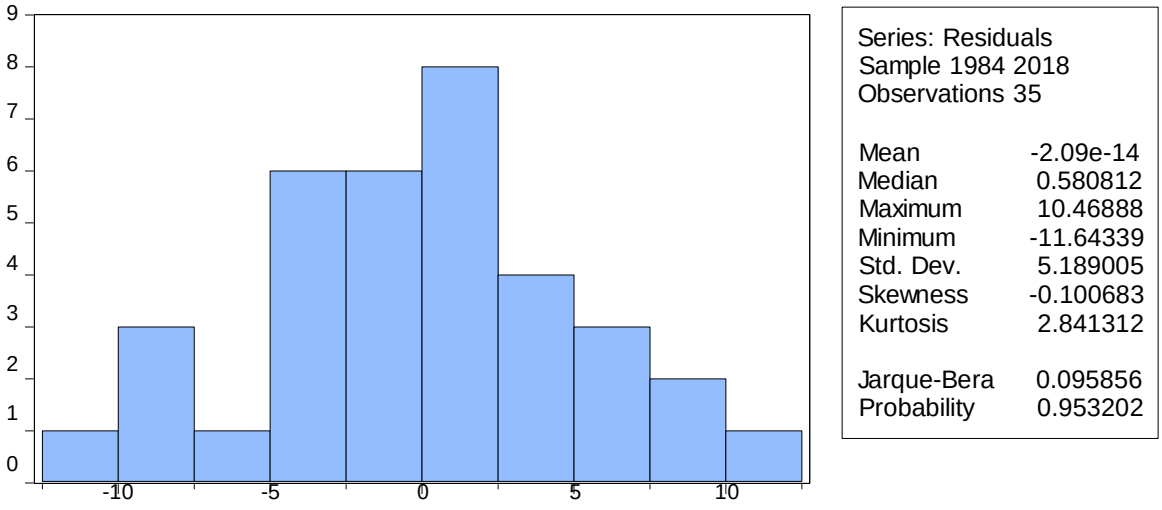
The stability of the ARDL model and the results of the post estimation diagnostics could affect the validity and robustness of the results of the impulse response functions and other diagnostics, and thus should be tested prior to further analysis. As a result, first we have tested for ARDL stability, and the result in the figure 4.2 presented below shows that all roots of characteristic polynomial lie inside the unit circle which suggests that the ARDL is stable. Stability of the system confirms that impulse response functions can be used in our analysis.

Figure 4. 3: Inverse Root of AR Characteristics Polynomial



The Jarque-Bera normality test is used to see whether the regression errors are normally distributed. The Jarque-Bera test failed to reject the null hypothesis of normal distribution of the residuals. Therefore, Jarque-Bera test for normality shows the regression errors are normally distributed.

Figure 4.4: Jarque-Bera tests for normality



H0= Normal Distribution

H1=H0 is not true so, the probability of Jarque-Bera test is 0.953% we accept the null hypothesis.

An inverse root of autoregressive characteristic polynomial tests the stability of the ECM model. The result of the test is shown by a graphical representation on figure 4.2 It shows that the ARDL model is stable as the entire modulus lie inside the circle showing that all the values are less than unity.

4.2.4. Error Correction Model

The ECM consists of two parts: the long run co-integrating coefficients, which are used to see the long run relationship; and the short run coefficients. The results of the unrestricted estimates of the co-integrating relationship and the adjustment coefficients normalized on real GDP are given in the below table.

Long run relationship

The above equation shows that, in the long run, LRGDP can be explained by remittance, capital formation, population growth, inflation, government expenditure and real exchange rate in Ethiopia. The long run impact of LREM on real GDP is found to be positive implying that it has n positive impact on real GDP in the long run. That is a one percentage increase in remittance will lead to a 2.24 percentages increase in real GDP. Whereas the long run impact of LINF is found to be negative showing an adverse impact on real GDP. That is a one percentage increase in real GDP will lead to 0.065 percentages fall in real GDP in the long run.

Short run relationship

Appendix IX shows the results of the D (RGDP) equation in the error-correction model, from which the short-run impact of D (LREM), D (LCFO), D (LPOP), D (LINF), D (LGEX) and D (LRER) on economic growth (real GDP) can be analyzed.

The previous period deviation from long run equilibrium is corrected in the current period as an adjustment speed of 21 percent. We also found that a percentage change in D (LREM) is associated with a 2.51 percent increase in D (LRGDP) on average ceteris paribus in the short run.

Table 4.4: Error Correction Estimates

Cointegrating Eq:	CointEq1	CointEq2	CointEq3	CointEq4
LRGDP(-1)	1.000000	0.000000	0.000000	0.000000
LREM(-1)	0.000000	1.000000	0.000000	0.000000
LCFO(-1)	0.000000	0.000000	1.000000	0.000000
LPOP(-1)	0.000000	0.000000	0.000000	1.000000
LINF (-1)	0.060235	-0.055712	-0.143951	-0.026681
	(0.13757)	(0.01804)	(0.24083)	(0.03662)
	[0.43784]	[-3.08809]	[-0.59773]	[-0.72861]
LGEX (-1)	52.23529	-9.403454	-176.2002	-26.33275
	(13.1964)	(1.73052)	(23.1008)	(3.51254)
	[3.95831]	[-5.43388]	[-7.62746]	[-7.49678]
LRER (-1)	-0.011958	0.003442	0.025701	0.005840
	(0.02464)	(0.00323)	(0.04314)	(0.00656)
	[-0.48522]	[1.06509]	[0.59574]	[0.89026]
C	-13.02692	0.705651	14.65918	-14.56026

Post estimates diagnostics

We have also tested for autocorrelation, normality and heteroscedasticity and the results are reported in the Appendix. The LM test for serial correlation indicates that the model is free from autocorrelation problem while White test for heteroscedasticity fails to reject the null hypothesis of homoskedastic variance. In addition, the Jarque-Bera test rejects the null hypothesis that the residuals are multivariate normal.

4.2.5. Analysis of Impulse Response and Variance Decomposition

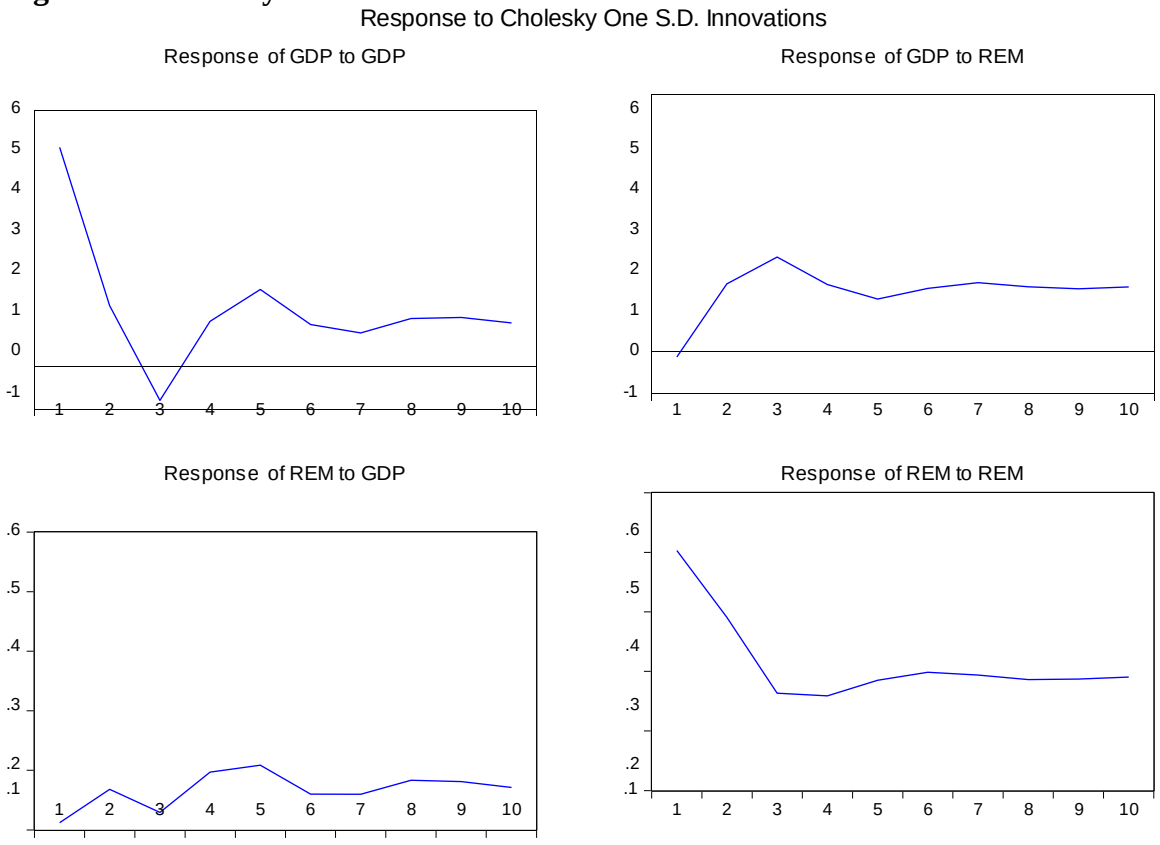
4.2.5.1 Impulse Response Function (IRF)

Impulse response functions may supplement the short run analysis because it shows us the dynamic impact of changes or impulses in the variables in the model on real GDP, given the model is stable. In other words, impulse response functions could tell us how

real GDP may respond, at a given time, to a one standard deviation innovation (impulse) generated from any of the variables in earlier times and how that effect may be multiplied.

As we can see from the below figure a negative shock in the 1st period and a positive shock in the 2nd period in real GDP results a Positive response of real GDP but has a positive response of REM for the whole forecasting period. We can also see that a positive shock in REM leads to a positive response for both real GDP and REM in the whole forecasting period.

Figure 4.5 Cholesky one S.D. Innovions



4.2.5.2 Variance Decomposition of RGDP

Variance decomposition provides a different method of depicting the system dynamics. It decomposes variation in an endogenous variable in to the component shocks to the endogenous variables in the ECM. It gives information about the relative importance of each random change in the explanatory variables in the ECM.

Table4. 5: Variance Decomposition of LRGDP

Period	S.E.	LRGDP	LREM	LCFO	LPOP	LINF	LGEX	LRER
1	4.967386	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	5.731213	81.61239	5.130196	3.370985	0.011568	8.939952	0.677779	0.257126
3	6.752409	59.90516	9.602856	7.005101	0.515079	7.944580	14.82648	0.200749
4	7.157045	56.96389	9.658305	9.490403	0.545788	7.074835	16.06287	0.203908
5	7.323460	55.47176	9.291055	9.066749	0.559450	8.801557	16.60920	0.200224
6	7.349143	55.35131	9.412849	9.022885	0.595764	8.741905	16.67517	0.200116
7	7.541737	53.23970	9.696084	9.570242	0.565923	8.734950	17.99734	0.195764
8	7.575700	53.20020	9.630967	9.732233	0.592227	8.779563	17.86839	0.196418
9	7.591663	53.02688	9.621791	9.693701	0.590450	8.979389	17.89217	0.195618
10	7.604716	52.88775	9.637680	9.691297	0.595282	9.003207	17.98983	0.194947

As we can see from the above table the rows that indicate the percentage of forecast error variance by the variable at the top head. For our interpretation the 3 periods are used as a short run and the rest as a long run.

In the short run a hundred % of forecast error variance in Real GDP is explained by the variable itself which means other variables in the model do not have strong influence on real GDP. Whereas in the long run 52.88% of forecast error variance in real GDP is explained by the variable itself, which means other variables in the models have a strong influence in predicting real GDP in the long run.

CHAPTER FIVE

5. Conclusion and Recommendation

5.1. Conclusion

Economic growth has been one of the dominant issues among the macroeconomic objectives of developing countries like Ethiopia. In their attempt to attain continuous and broad based growth, governments have been implementing various macroeconomic policies, by identifying the potential determinant factors of economic growth. The growth literature had identified various determinant factors for growth, the attention given to remittance, even if it is slightly accessed. This is despite the growing flow of this foreign finance to under developed countries in general and Ethiopia in particular in association with the huge migrant stock all over the world. Besides, the diverse channels through which migrant remittance can affect growth had let to the difficulty of identifying its impact theoretically, which makes the topic an empirical one.

In this study, an attempt is made to analyze the contribution of migrant remittance on economic growth using time series data ranging from 1984 to 2018. The data for the study is obtained from NBE and MoFED and World Bank Development Indicators Data base. The econometric part of this study had employed the most recently developed Vector autoregressive model Vector error correction model. 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 LREM, LCFO, LPOP, LINF, LGEX and LRER which are the independent variables.

From the descriptive analysis the trend of the inflow of remittance has revealed that the total amount of remittance inflow started to show significant increment, mainly since 2002. Between 1984 and 2003 remittance flows have steadily grown from 10 million USD to 40 million USD. By 2004, remittance inflow had over passed 100 million USD.

The result of the econometric analysis indicated that there is a short run and long run relationship between economic growth and the explanatory variables in different magnitude. It is also found that LREM affects economic growth positively and significantly both in the short run and long run, which is in line with the theoretical foundation. Regarding LCFO, the result confirmed that it affects growth negatively both in the short run and long run. On top of that, the causality test applied had showed that there is uni directional causality which runs from LREM to LRGDP.

LGEX have a negative impact in the short run but have a positive effect in the long run. LPOP have also found to positively and significantly affecting growth both in the short and long run. Finally, the result of the study has revealed that LINF 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.

5.2. Recommendation

Based on the finding of this paper the following recommendation is made for the concerned or responsible party.

In particular, to the remittance, as the study showed it has a positive role in promoting growth in both the short run and long run. Hence, in order to sustain this role, the issue is that the financial sector should be further modernized and simplify in terms of remittance products provided and through branch expansion in addressing wide range of customers. Moreover, the state bank in our case National Bank of Ethiopia, Commercial Banks, and remittance service providers should work collaboratively in diverting the remittance high incoming flow through the informal channel towards the formal way, through awareness creation, formulating proper and flexible regulation, decreasing the cost of sending, so that the economy will be able to extract the benefit remittance to the economic growth in a better way. 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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APPENDIX I

Augmented Dickey-Fuller 1st Difference Unit Root Test

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.585120	0.0000
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.366037	0.0000
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	

Null Hypothesis: D(LCFO) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.813657	0.0000

Test critical values:	1% level	-3.646342
	5% level	-2.954021
	10% level	-2.615817

*MacKinnon (1996) one-sided p-values.

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.335560	0.0000
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.158208	0.0000
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	

Null Hypothesis: D(LGEX) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*

Augmented Dickey-Fuller test sta istic		-8.071797	0.0000
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.325120	0.0001
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	

APPENDIX II

Phillips-Perron 1st Difference Unit Root Test

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-10.68560	0.0000
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	

Null Hypothesis: D(LREM) has a unit root

Exogenous: Constant

Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.586922	0.0000
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.656113	0.0000
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	

Null Hypothesis: D(LPOP) has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.145111	0.0000
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LINF) has a unit root
Exogenous: Constant
Bandwidth: 20 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*

Phillips-Perron test statistic		-23.30238	0.0001
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	
*MacKinnon (1996) one-sided p-values.			

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-17.86000	0.0001
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.547783	0.0001
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	

APPENDIX III
APPENDIX V
Granger Causality/Block Exogeneity Wald Tests

Granger Causality/Block Exogeneity Wald Tests
Date: 05/30/20 Time: 21:04
Sample: 1984 2018
Included observations: 33

Dependent variable: LRGDP

Excluded	Chi-sq	df	Prob.
LREM	2.539755	2	0.2809
LCFO	0.033741	2	0.9833
LPOP	0.022830	2	0.9886
LINF	4.356628	2	0.1132
LGEX	5.712790	2	0.0575
LRER	0.076744	2	0.9624
All	26.98155	12	0.0078

Dependent variable: LREM

Excluded	Chi-sq	df	Prob.
LRGDP	0.191652	2	0.9086
LCFO	0.382044	2	0.8261
LPOP	0.123859	2	0.9399
LINF	3.989825	2	0.1360
LGEX	2.501637	2	0.2863
LRER	1.813017	2	0.4039
All	12.28440	12	0.4231

Dependent variable: LCFO

Excluded	Chi-sq	df	Prob.
LRGDP	1.364296	2	0.5055
LREM	3.385122	2	0.1840
LPOP	4.405108	2	0.1105
LINF	1.143484	2	0.5645
LGEX	2.463575	2	0.2918
LRER	1.743088	2	0.4183
All	17.24876	12	0.1405

Dependent variable: LPOP

Excluded	Chi-sq	df	Prob.
LRGDP	0.281203	2	0.8688
LREM	0.168912	2	0.9190
LCFO	0.995538	2	0.6079
LINF	0.651325	2	0.7220
LGEX	1.909181	2	0.3850
LRER	1.116209	2	0.5723
All	10.42836	12	0.5784

Dependent variable: LINF

Excluded	Chi-sq	df	Prob.
LRGDP	2.662194	2	0.2642
LREM	4.014386	2	0.1344
LCFO	2.434729	2	0.2960
LPOP	1.367453	2	0.5047
LGEX	0.933050	2	0.6272
LRER	0.935376	2	0.6264
All	11.50399	12	0.4863

Dependent variable: LGEX

Excluded	Chi-sq	df	Prob.
LRGDP	0.050568	2	0.9750
LREM	0.290644	2	0.8647
LCFO	1.542128	2	0.4625
LPOP	1.198327	2	0.5493
LINF	1.936672	2	0.3797
LRER	0.644301	2	0.7246
All	11.78133	12	0.4634

Dependent variable: LRER

Excluded	Chi-sq	df	Prob.
LRGDP	10.97871	2	0.0041
LREM	2.024767	2	0.3634
LCFO	10.70166	2	0.0047
LPOP	4.475071	2	0.1067
LINF	46.43448	2	0.0000
LGEX	1.883851	2	0.3899
All	135.4115	12	0.0000

APPENDIX VI

Residual Serial Correlation LM Tests

Lags	LM-Stat	Prob
1	48.64217	0.4875

APPENDIX VII

Residual Heteroskedasticity Tests

641.3709	616	0.2321