Effect of International Remittance Inflows on Investment and Economic Growth in Ethiopia, Kidanemariam Gidey[1]

Abstract

According to the World Bank migration and development report, Ethiopia is among the top remittance-receiving countries in Sub-Saharan Africa. But little attention was given to evaluating the effect of remittance inflows on the Ethiopian economy. Therefore, this paper investigated the relationship between international remittance inflows, private investment, and economic growth in Ethiopia over the year 1991-2020. This study has applied ARDL methods of co-integration to explore the relationship between these economic variables. The result from the econometric analysis indicated that international remittance has a significant positive effect on both private investment and economic growth in the long run. But its effect was found to be statistically insignificant in the short run, though the coefficients are positive. The descriptive analysis also clearly shows that remittance inflow to Ethiopia continuously declined after 2014, though the total number of migrants leaving the country is increasing. This could be mainly because of political instability and the current COVID-19 pandemic effect.

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Introduction

Remittance inflows to developing countries are large and continuously increasing from time to time (Gebbisa and Feyissa, 2019, Tenaye, 2019 and Issuf, 2018). According to the 2019 International Organization for Migration (IOM), global remittances have grown from an estimated USD 126 billion in 2000 to USD 689 billion in 2018, despite the actual size of global remittances are likely to be bigger than this estimate. The 2019 World Bank migration and remittance brief no.31 report indicated that annual remittance flows to low- and middle-income countries (LMICs) is increasing from time to time. For instance, in 2018, remittance flows to LMICs reached $529 billion, showing an increase of 9.6 percent over 2017. This figure has reached to USD 550 billion in 2019. This would make remittance flows larger than foreign direct investment and official development assistance flows to LMICs. Remittances are also more stable than foreign direct investment and are thus a critical and stable source of external finance for Africa (UNCTAD, 2019).

The flow of remittances into developing countries is attracting increasing attention because of their rising volume and their impact on the macroeconomic performance of receiving countries in different ways. According to UNDP (2017) report, remittances serve as a strategic buffer stock that helps to increase foreign exchange reserves, support macroeconomic stability and allow for investments and growth in many African countries. In addition, remittances have been identified as a potential source of funding for economic development (UNDP, 2011).

In Ethiopia, people migrate to the rest of the world for many reasons, including unemployment, poverty, drought, and human rights abuses. The paths and destinations of Ethiopian migrants are as diverse as that of the causes (Adugna, 2019). In general, the total number of migrants from the country to the rest of the world continuously increases. For instance, the total number of migrants has increased from 445.9 thousand in

2000 to 946.1 thousand in 2020 (UN DESA, 2019). Similarly, international remittance flows to the country have increased rapidly over the past decade (Alem & Andersson, 2019). According to the World Bank migration and development brief no.31 report (2019), Ethiopia is among the top remittance-receiving countries in Sub Saharan African (SSA). The amount of remittance inflow in 1991 was USD 5.2 million. After ten years, this figure has increased by more than ten-fold and reached USD 53.2 million in 2001 (WB, 2020). Similarly, this value increased thirty-fold in the next fourteen years and was recorded at USD 1.7 Billion in 2014. In the next three years, remittance sharply declined, mainly due to the anti-government protest and violence that occurred in the country.

Even though migration and remittance inflows are rising in developing countries, including Ethiopia, the empirical literature on the role of remittances on the economy of receiving country is still a matter of intense debate among policymakers and scholars in economics and other disciplines. Some empirical studies indicated that remittance inflows positively affect investment and economic growth (Chimi et al., 2008; Senbeta 2013; UNCTAD, 2019). Conversely, other researchers contend that migration remittance might not positively affect investment as remittances in developing countries are mainly driven by altruism and are usually used to smooth consumption and improve welfare. It can also have an adverse effect due to the moral hazard problem that remittances create. That means the income from remittances may result in a decrease in work effort and productivity, which then translates into a reduction in the labour supply for the developing country (Shera & Meyer, 2013). This argument is confirmed by different research results in different countries. For instance, the research finding conducted by Shimul (2013) showed that remittance does not have a significant contribution to economic growth both in the short and long run in Bangladesh. Another research done by Jawaid and Raza (2012) showed that remittance has a significant negative effect in the long run and the short economic growth in China.

In Ethiopia, the role of foreign remittance on macroeconomic variables has been studied by some scholars. For instance, research done by UNCTAD (2019) confirmed that, in Ethiopia, remittances received from international migrants are more likely to be used for business investments and development, which have a favorable effect on economic growth. Similarly, Yaekoba (2014) and Solomon (2020) argued that remittance inflow has a significant impact on economic growth by increasing real private investment and fixed capital accumulation which reduces current account deficit, external debt burden and improves human capital. Similarly, Nuredin (2018) also confirmed that remittance inflows affect both economic growth and investment positively in the long run, which shows the potential of remittance to serve as an alternative source of capital for investment and entrepreneurial purposes.

However, other research findings challenge the positive effect of remittance on economic growth in Ethiopia. For instance, an empirical result obtained by Tolcha & Rao (2016) revealed that remittance has a significant negative effect on economic growth in Ethiopia in the long run. However, it has positive impacts in the short run. Another research conducted in Ethiopia, Kenya and Uganda by Zerihun (2020) confirmed that remittance inflow has no significant impact on economic growth. However, there is a long-run relationship between the variables. Other researchers such as Nuredin (2018) and Kifle (2014) also reveal that in the short-run, remittance affects both economic growth and investment negatively due to remittance's consumption smoothening role in the short run.

These mixed findings show the absence of a consistent exploration on the effect of remittances on investment and economic growth. Likewise, little attention was given to evaluating the impact of remittances on investment and economic growth. Even the simultaneous effect of remittance inflow on investment and economic growth in Ethiopia has not been adequately studied in our country; rather, it has been mostly studied from its effect of economic growth point of view. Therefore, this research has contributed to the existing body of literature

in developing countries in general, in Ethiopia in particular, by examining the effect of international remittance inflows on both private investment and economic growth in Ethiopia. The study specifically addressed the following research questions:

1. What looks like the trend and performance of remittance inflows between the years 1991 to 2020?
2. What is the effect of remittance inflow on investment in Ethiopia?
3. What is the effect of remittance inflow on economic growth in Ethiopia?

Literature Review
Theoretical Literature
The Impact of Remittance on Recipient Countries (Economies)

The impact of international remittances inflow on the economy of recipient countries has been the subject of continuous debate over the last five decades. These debates can be broadly categorized as "optimist's view", "pessimist's view" and Pluralistic view (Haas, 2007 and Ångman & Larsson, 2014).

According to the "optimistic view", flows of remittances as well as experience, skills and knowledge that migrants acquire abroad will enhance development in the recipient countries (Anaynwu & Erhijakpor, 2010). This group of scholars believes that remittance has a direct positive impact on the development process of recipient societies through savings and investment and, indirect positive effects through consumption and access to credit (Francois et.al, 2022). It can also impact growth positively by transferring knowledge (brain gain), reducing income inequality & promoting human capital formation which can stimulate development and modernization. Specifically, in developing countries where labor supply is abundant but opportunities for employment are scarce, remittances can help initiate self-employment through creating access to credit (Meyer & Shera, 2017).

On the other hands, "pessimists" believe that remittance tends to negatively affect the socio-economic condition of a recipient country via dependency syndrome, brain drain, the development of conspicuous consumption patter, aggravating income

inequality and appreciation of exchange rate. Most of the pessimistic view on remittance draws on structuralist social theory, which encompasses neo-Marxist, dependency world systems, and, at least to a certain extent, cumulative causation theory (Haas, 2007). These groups of scholars argues that remittances have mostly been used for excessive consumption, housing and land purchase rather than for activities that increase investment and productive capacity that contributes to long-run growth (Mallick, 2020 & Chaudhary, 2020). Furthermore, remittances can lead to moral hazard or dependency syndrome that could negatively affect economic growth as recipients may reduce their participation in productive activities (Mallick, 2020). That means, if the amount of remittances exceeds the recipient's expected earnings from work, it can discourage labor force participation, induce voluntary unemployment and foster a culture of dependency in the recipient countries (Francois et.al, 2022).

There is also another view known as "pluralistic view". According to the proponents of this theory both of the above theories are too static (Adenutsi, 2010). This view argues that there is no strictly negative nor positive outcomes of remittances in the remittance receiving countries, the issue is more complex. According to this theory, the effects of remittances are thus *context-dependent* (De Haas, 2007; Taylor, 1999). The effect of remittance on the economy depends on the macroeconomic behavior and institutional quality of the recipient economy. These effects depend on how remittances are utilized in the recipient economy. For instance, if the capital from remittance is used for consumption, this has an adverse effect on macroeconomic outcomes. If spent on capital goods, there will be a spill-over effect on investments and savings and the remittances can stimulate local production and exports (Kadozi, 2019).

Empirical Literature
There are a lot of empirical studies that examine the effect of remittances on investment and growth in recipient countries, yet the results of those studies remain inconclusive.

Several studies found that there is a positive

relationship between remittances, investment and economic growth. For instance, Khan et.al (2019) undertaken research to examines the association between remittances inflow and investment in five major remittance receiving Asian countries over the period 1990 to 2016.: India, Sri Lanka, Pakistan, Nepal, and Bangladesh. This research revealed that private investment is positively affected by remittances inflow though the impact of remittance flow with low business freedom opposes the positive association in the case of these sampled countries. Further research conducted by (Mim and Ali, 2012) in 15 Middle East and North Africa countries over the period 1980 to 2009 found a positive and significant influence of remittances on investment, and economic growth. Another research conducted in a sample 34 SSA economies during the year 1980–2004 by Baldé (2011) also confirmed that international remittance transfers can have an indirect effect on economic growth through savings and investment. Research conducted in Pakistan over the period 1994-2009 by (Yasmeen, Anjum, Yasmeen, and Twakal, 2011) showed that workers' remittances can have a positive role on private investment and total consumption.

However, remittances can also have an adverse impact on economic growth and development in recipient countries by reducing incentives to work, and therefore reducing labor supply or labor force participation. Remittances increase the recipients' income and can weaken their incentives to work, which, in turn, slows economic growth. (Perez-Saiz et.al, 2019). It might also adversely affect long-run growth through appreciation of the real exchange rate in recipient economies and generate a resource reallocation from the tradable to the non-tradable sector (Adolfo et.al ,2010 and Khan et.al ,2019).

With respect to Ethiopia, research done by UNCTAD (2019) proved that, remittances received from international migrants are more likely to be used for business investments and development, which have a favorable effect on economic growth. Similarly, Yaekoba (2014) and Solomon (2020) argued that remittances inflow has a significant impact on Economic growth by

increasing real private investment and fixed capital accumulation which reduce current account deficit, external debt burden and improving human capital. Similarly, Nuredin (2018) also confirmed that remittance inflows affect both economic growth and investment positively in the long run which shows the potential of remittance to serve as an alternative source of capital for investment and entrepreneurial purposes. However, other research findings challenge the positives effect of remittance on economic growth in Ethiopia. For instance, an empirical result obtained by Tolcha & Rao (2016) revealed that remittance has a significant negative effect on economic growth in Ethiopia in the long run, though it positively impacts in the short run. Another research conducted in Ethiopia, Kenya and Uganda by Zerihun (2020) confirmed that remittance inflow has no significant impact on economic growth, though there is a long-run relationship between the variables. Other researchers such as Nuredin (2018) and Kifle (2014) also reveals that in the short-run remittance affects both economic growth and investment negatively due to remittance's consumption smoothening role in the short run.

Materials and Methods

Research Design
To analyze the effect of remittance inflow in investment and economic growth, quantitative research design (explanatory research design) was applied.

Model Specification
Though there are many co-integration approaches, this study has used Autoregressive Distributed Lag (ARDL) Model to analyzing the long run and short run effects of remittance on private investment and economic growths in Ethiopia. This popular approach was developed by Pesaran et al. (2001). It is also known as the ARDL bounds testing. This approach has several advantages over other co-integration techniques (Pesaran et al., 2001). First, it is applicable irrespective of whether the underlying regressors are purely I (0), purely I (1) or fractionally integrated. Second, the model uses a sufficient number of lags to capture the data-generating process in general to the specific modeling

framework. Third, the error correction model is derivable from the ARDL through a simple linear combination, which integrates both short-run adjustments with long-run information without losing the latter's information. Fourth, the small samples properties of the ARDL procedure are far superior to those of the multivariate co-integration techniques. Fifth, endogeneity and serial correlation problems are corrected through appropriate lag selection. (Umoh and Effiong, 2013).

In this research, two co-integration models were estimated. In the 1st model, private investment was taken as dependent variable and remittance inflow was taken as explanatory variables. In the 2nd model, economic growth was taken as dependent variable & remittance was taken as independent variable. In both models, other main control variables were included in addition to remittance. The detail specification of co-integration mode-1 and Model-2 is shown as follows.

In the above model, $LINV_t$ is the private investment (dependent variable), which is proxied by gross fixed capital formation, is measured in percentage. $LREM_t$ is international remittances received is my variable of interest and is measured in terms of remittances received to GDP. Here remittances and private investment are expected to have a positive relationship. The remaining five explanatory variables are control variables which are added in the model to control for the effect of other most important factors that determine private investment. $LGDP_t$ is the real GDP level used as a proxy for economic growth; $LFDI_t$ is foreign direct investment to GDP ratio which is expected to have a positive effect on private investment. $LGOV_t$ is total government spending to GDP ratio and would have positive impact through creating conducive environment to the private investment. $LLIR_t$ is lending interest rate which is taken as a cost of borrowing investment funds. An inverse relationship is expected between lending interest rate and

Cointegration Model-1: The role of remittance on private investment

$$\Delta LINV_t = \alpha_o + \lambda_1 LREM_{t-i} + \lambda_2 LGDP_{t-i} + +\lambda_3 LLIR_{t-i} + \lambda_4 LFDI_{t-i} + \lambda_5 LGOV_{t-i} + \lambda_6 LINF_{t-i} + \beta_1 \sum_{i=1}^{n} \Delta LINV_{t-i}$$

$$+ \beta_2 \sum_{i=0}^{n} \Delta LREM_{t-i} + \beta_3 \sum_{i=0}^{n} \Delta LGDP_{t-i} + \beta_4 \sum_{i=0}^{n} \Delta LLIR_{t-i} + \beta_5 \sum_{i=0}^{n} \Delta LGOV_{t-i} + \beta_6 \sum_{i=0}^{n} \Delta LINF_{t-i} + \beta_7 D_1 + \beta_8 T + u_t$$

Where: $LINV_t$ = Logarithm of private investment as a % of GDP at time t.

$LREM_t$ = Logarithm of remittance inflow as a % of GDP at time t.

$LGDP_t$ = Logarithm of real GDP at time t.

$LFDI_t$ = Logarithm of foreign direct investment as a % of GDP at time t.

$LGOV_t$ = Logarithm of government expenditure as a % of GDP at time t.

$LLIR_t$ = Logarithm of lending interest rate at time t.

$LINF_t$ = Logarithm of consumer price index at time t.

D_1 = Regime change dummy

T = Time trend

u_t = error term

α_o = constant term

$\beta1$, $\beta2$, $\beta3$, $\beta4$, $\beta3$, $\beta5,\beta6$, $\beta7$, and $\beta8$, are elasticity coefficients.

investment. $LINF_t$ is rate of inflation which is taken as a proxy for macroeconomic stability. The effect of inflation on investment cannot be predicted (it could have positive or negative effect). D_1 is a dummy variable for regime change.

which is taken as a proxy for macroeconomic environment. The effect of inflation on investment cannot be predicted (it could have positive or negative effect). D_1 and D_2 are dummy variables for regime change and recurrent drought.

Cointegration Model-2: The role of remittance on economic growth

$$\Delta LGDP_t = \alpha_0 + \lambda_1 LREM_{t-i} + \lambda_2 LHC_{t-i} + \lambda_3 LGOV_{t-i} + \lambda_4 LFDI_{t-i} + \beta_1 \sum_{i=1}^{n} \Delta LGDP_{t-i} +$$

$$\beta_2 \sum_{i=0}^{n} \Delta LREM_{t-i} + \beta_3 \sum_{i=0}^{n} \Delta LHC_{t-i} + \beta_4 \sum_{i=0}^{n} \Delta LGOV_{t-i} + + \beta_5 \sum_{i=0}^{n} \Delta LFDI_{t-i} + \beta_6 D_1 + \beta_7 D_1 + \beta_8 T + u_t$$

Where: $LGDP_t$ = Logarithm of real gross domestic product (GDP) at time t.

$LREM_t$ = Logarithm of remittance inflow as a % of GDP at time t.

LHC_t = Logarithm of human capital augmented labor force at time t.

$LGOV_t$ = Logarithm of government expenditure as a % of GDP at time t.

$LFDI_t$ = Logarithm of foreign direct investment as a % of GDP at time t.

D_1 = Draught dummy

T = Time trend

u_t = error term

α_0 = constant term

$\beta1$, $\beta2$, $\beta3$, $\beta4$, $\beta3$, $\beta5$, $\beta6$, and $\beta7$, are elasticity coefficients.

In this model, $LGDP_t$ is real gross domestic product, taken as a dependent variable. $LREM_t$ is international remittances received is may variable of interest and measured in terms of remittances received to GDP. Here remittances and gross domestic product are expected to have a positive relationship. The remaining five explanatory variables are control variables which are added in the model to control for the effect of other most important factors that determine economic growth. LHC_t is human capital augmented labor force which is expected to have a positive impact on economic growth. $LFDI_t$ is the ratio of foreign direct investment to GDP ratio is expected to have a positive effect on economic growth through diffusion of technology and managerial skill. $LGOV_t$ is total government spending to GDP ratio and would have positive impact through creating conducive environment to the private investment. $LINF_t$ is rate of inflation

All variables are transformed into logarithmic forms, which help to have relatively stationary series and a higher robustness to autocorrelation. While estimating both of the above models, I have used HAC (Newey-West disturbance covariance matrix) estimator which leads to higher heteroskedasticity and autocorrelation consistency.

Sources of Data
This researcher has uses used secondary sources of data. Thirty years annual time series data from 1991-2020 were used from sources. Specifically, the data was obtained from National bank of Ethiopia (NBE), Ethiopian Economic Association, World Development Indicators (WDI), UNICTAD and Pen World databases.

Estimation Procedure
Before estimating the model, stationarity (the degree of integration) of all variables

were tested by using Augmented, Dickey-Fuller unit root test and Phillips-Perron unit root test. Then the ARDL bound test developed by (Pesaran et al., 2001) was applied to test the long run relationship between the variables. Lastly, the long-run and short run and error correction terms are estimated from the conditional ARDL model.

After estimating the long run and short run models, misspecification test, normality test, serial correlation test, heteroscedasticity test and Ramsey Reset test of model specification tests were undertaken to check the robustness of the model. To estimate the models and to perform the pre-estimation and post estimation diagnostic tests, Eviews9 statistical package was used.

Results and Discussion

Descriptive Analysis

Trend of Remittance Inflows to Ethiopia (1990-2020)
The trend of international remittances inflow to Ethiopia is reported in Figure 1 and Figure 2. The trend of these flows is reported in current US$ and as a percentage of GDP over the period 1990-2020. The reported data shows that officially a recorded remittance flow to Ethiopia was about US$ 5.2 million in 1990. After ten nears, this figure has increased by more than ten-fold, and reached to US$ 53.2 million in 2000 (WB, 2020). In the same manner this value has generally increases by more than eight-fold and recorded US$ 436 million in 2010. However, there was a sharp decline in remittance flows to Ethiopia in 2009. This could be because of the unfavorable effect of financial crisis experienced by many advanced countries. A critical look into the data reveals that remittances in Ethiopia have remarkably increased in the next four years and reached to US$ 1.8 billion in 2014. But it starts to sharply decline between 2014 and 2017, mainly due to the anti-government protest and violence occurred in the country. In the next two years it started to recover. The line graph clearly indicates the negative effect of COVID-19 pandemic on remittance inflows to Ethiopia. The COVID-19 pandemic has badly affected the remittance providers. As a result, Ethiopian migrants, especially those in western high-income countries, have lost jobs or seen their incomes drop, reducing

their ability to send money home. The remittance to GDP ratio of Ethiopia reported in Figure 2 also shows almost similar trend with the total volume of remittance reported

.Top Ten Remittances Receiving Sub-Saharan Africa Countries

Remittances to Sub-Saharan Africa registered in 2019 was about UD$ 48 billion. Due to the COVID-19 crisis, remittance flows to the region has declined to US$ 42.5 billion in 2000, while a recovery of 4 percent is expected in 2021.The anticipated decline can be attributed to a combination of factors driven by the COVID-19 outbreak in key destinations where African migrants reside including in the EU area, the United States, the Middle East, and China (WB,2020). The COVID-19 pandemic has knockout remittances providers in a variety of ways: Sub-Saharan migrant workers, especially those in high-income countries, have lost jobs or seen their incomes fall, reducing their ability to send money home. In addition, weak oil prices have affected outward remittances to Africa from the Gulf Cooperation Council countries (Brookings, 2020).

Table 1 depicts the top ten SSA countries that received the highest remittances in 2020. Accordingly, Nigeria, Ghana, Kenya, Senegal and Somalia are the top five remittance recipients. Specifically, Nigeria received US$ 17.21 billion which is the highest among SSA countries. This would represent 40.4 % of total flows to Sub-Saharan Africa countries in 2020 and would make Nigeria the second-largest African recipient in that year after Egypt (US$ 29.6 billion). Ghana and Kenya are ranked 2nd and 3rd among the top remittances-receiving countries in SSA, with flows of US$4.29 billion and US$ 3.1 billion, respectively, in 2020. The share of Ghana and Kenya from SSA is 10.1% and 7.3% respectively. Senegal and Somalia are the fourth and fifth largest remittance receiving countries in SSA, with US$ 2.56 and 1.74 billion. Other countries with close to US$ 1 billion of remittances inflows in 2020 (US$ 1.1 billion on average) include Zimbabwe, South-Sudan, D.R Congo (Dem, Rep), Uganda, and Mali. Ethiopia is the eighteenth country in SSA receiving US$ 404.1 million. Ethiopia
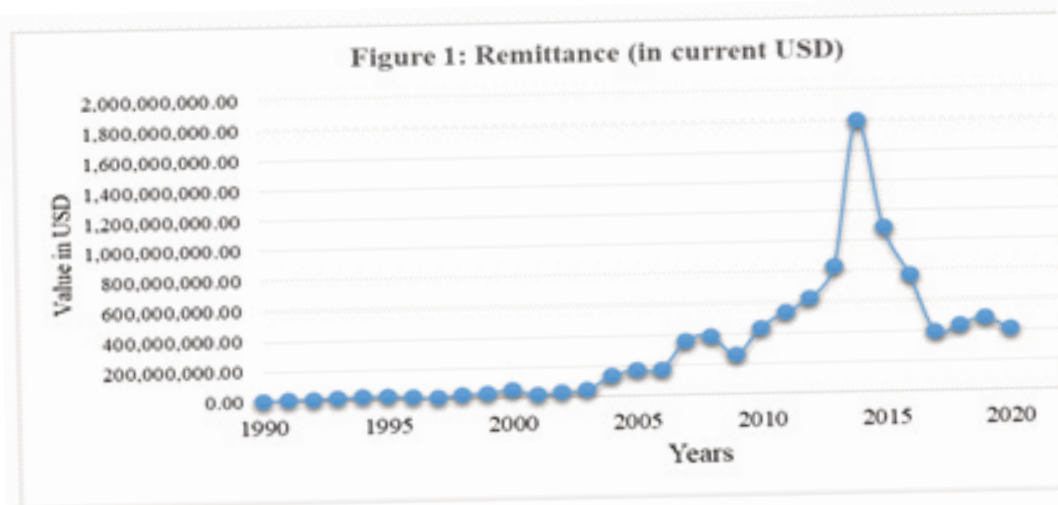
Figure 1: Remittance (in current USD)

Source: Own computation based on World Development Indicators-WDI (2020) data

Figure 2: Remitance inflow (as a % of GDP)
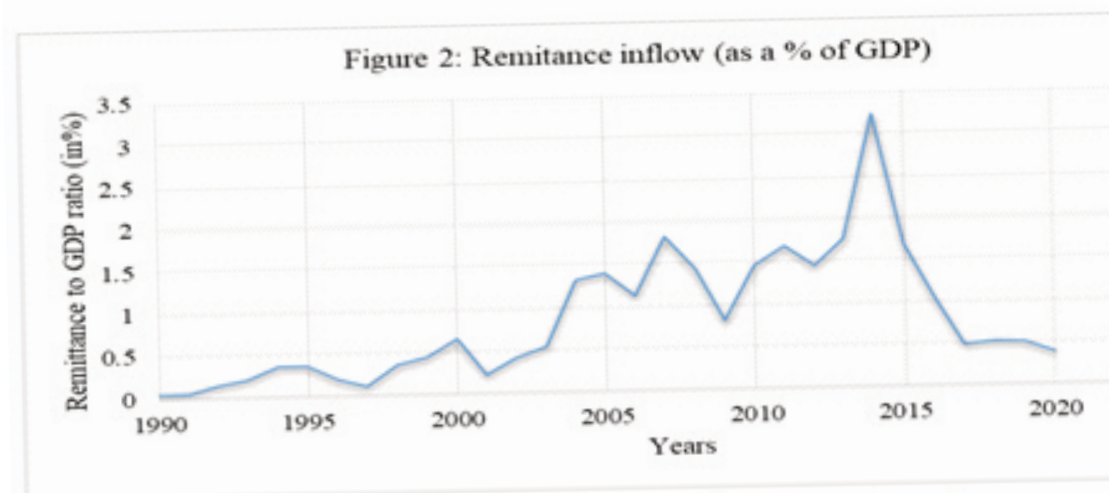
Source: Own computation based on World Development Indicators-WDI (2020) data

was one of the top ten remittance receiving countries in SSA in 2014 receiving about US$ 1.8 billion. The income of Nigeria from remittance is more than forty times higher than Ethiopia's income coming from remittance. The share of Ethiopia is less than 1% which is too small as compared to that of Nigeria.

Table 1: Top 10 Sub-Saharan Countries Receiving the Highest Remittances (2020)

S. N	Countries	Amount in USD	Share (%) from SSA
1	Nigeria	17,207,547,306.00	40.4
2	Ghana	4,291,956,800.56	10.1
3	Kenya	3,100,000,000.00	7.3
4	Senegal	2,561,899,541.77	6.0
5	Somalia	1,735,000,000.00	4.1
6	Zimbabwe	1,209,718,044.52	2.8
7	South Sudan	1,200,000,000.00	2.8
8	Congo, Dem. Rep.	1,109,067,595.07	2.6
9	Uganda	1,051,170,000.00	2.5
10	Mali	987,299,900.53	2.3
	SSA total	42,542,304,848.00	81

Source: Own competition using World Development Indicators-WDI (2021) database

Econometric Analysis

Econometric Analysis

Unit Root Test

One of the pre-estimation requirements of ARDL model is to check the stationarity of all the variables of interest, as unit root problem is usually expected for most time series data. Unless the non-stationary of the series is not corrected, we will be obliged to falsely concluding that there is a relationship between two unrelated non-stationary series (Gujarati, 2004 and Mekonnen 2017). To achieve this goal, the commonly used ADF and Phillips-Perron unit root test was applied to know the order of integration of each variable and to design methodology accordingly. The interpretation of both tests is done through comparing test statistics and critical values, whenever the absolute value of test statistics is greater than absolute values of critical values we reject null

hypothesis and accept alternative hypothesis meaning the variable is stationary; conversely, if the absolute values of test statistics is less than absolute values of critical values we accept null hypothesis and reject alternative hypothesis meaning that the data is suffering from unit root problem (Mekonnen 2017 and Tenaye,2019). The unit root testes result reported in Table 4 confirmed that lending interest rate (LLIR) and rate of inflation (LINF) are stationary at level at 1% and 5% level of significance, respectively while the remaining variables have unit root problem at level and become stationary at their first difference. This verifies that the variables in the model are mixed in order of integration and hence permit the possibility of employing an autoregressive distributive lag model (ARDL) to find the long-run coefficients and using an error correction mechanism (ECM) to get the short-run coefficients of both models (Model one and Model two).

The Long Run Effect of Remittance on Private Investment & Economic Growth

In order to test the existence of long-run relationship between the variables, ARDL-bound test developed by Pesaran (2001) was employed. Accordingly, the results shown in Annex Table-A &Annex Table-B indicate that the calculated F-statistic values for both models (4.1 and 12.28) are greater than the Pasaran upper bound critical values at 5% and 1% level of significance, respectively. This implies that the null hypothesis of no-cointegration has been rejected and the existence of long run relationship between the variables included in the models has been guaranteed. Once the existence of long-run relationship among the variables is confirmed, the long-run models was estimated, followed by short run results. These results are reported in Table 3 & Table 4.

Accordingly, remittances inflows have a positive and significant effect on private

Table 2: ADF and PP Unit Root Test results

Variables	ADF Unit Root Test			PP Unit Root Test		
	T-statistic	Prob.Values	Decision	T-statistic	Prob.Values	Decision
LINV	-0.281017	0.9872	Not Stationary	-1.458228	0.8208	Not Stationary
LREM	-1.972694	0.5912	Not Stationary	-1.918434	0.6193	Not Stationary
LGDP	-1.369547	0.8478	Not Stationary	-2.583688	0.2896	Not Stationary
LGOV	-2.695305	0.2460	Not Stationary	-2.949137	0.1629	Not Stationary
LLIR	-4.560413	0.0056	Stationary	-4.431065	0.0075	Stationary
LFDI	-2.881114	0.1827	Not Stationary	-3.054896	0.1355	Not Stationary
LINF	-3.947368	0.0226	Stationary	-3.851554	0.0279	Stationary
LHC	-2.875630	0.1843	Not Stationary	-3.026022	0.1426	Not Stationary
ΔLINV	-9.306443	0.0000	Stationary	-9.245601	0.0000	Stationary
ΔLREM	-5.583236	0.0005	Stationary	-9.330242	0.0000	Stationary
ΔLGDP	-5.926483	0.0002	Stationary	-5.806272	0.0003	Stationary
ΔLGOV	-5.860031	0.0003	Stationary	-11.20430	0.0000	Stationary
ΔLLIR	-3.749578	0.0353	Stationary	-3.729845	0.0367	Stationary
ΔLFDI	-5.493758	0.0006	Stationary	-5.513874	0.0006	Stationary
ΔLINF	-7.709388	0.0000	Stationary	-8.997772	0.0000	Stationary
ΔLHC	-5.473380	0.0007	Stationary	-5.491539	0.0006	Stationary

Source: Own computation based on CSA data

Note: Significance at 1%,5% and 10% is shown by *, **and***

Specifically, a one percent increase in remittances inflows cause a 0.28 percent increase in private investment and 0.04 percent rise in economic growth. This finding is in line with the "optimistic theory of migration", which advocates that flows of remittances will enhance capital formation (investment), economic growth and development in the recipient countries. The positive influence of remittances on investment and economic growth is in line with Khan, et.al (2019), Zerihun (2020), Awode, et.al (2021), and Yaekoba, (2014

coefficient is correctly signed (negative as expected).

According to the model results presented in Table 7 and Table 8, the coefficients of one period lagged value of the Error Correction Terms (ECT (-1)) are negative and significant confirming the existence of long run relationship among variables in both models (Banerjee, et al., 2003).The ECT (-1) coefficient value of the first model (investment model) is about 0.788 implying close to 47% of adjustment will be made in

Table 3: Long Run Estimates for Private Investment Model

Selected Model: ARDL (1, 0,1, 2, 1, 2, 1)				
Dependent Variable: LINV				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LREM	0.281141	0.071703	3.920900	0.0020
LGDP	0.664159	0.171319	3.876732	0.0022
LGOV	1.529505	0.454793	3.363076	0.0056
LLIR	-0.666195	0.675717	-0.985908	0.3436
LFDI	0.000617	0.105692	0.005835	0.9954
LINF	1.590860	0.879857	1.808090	0.0957
REGM	0.067449	0.144291	0.467449	0.6486
C	-10.761818	4.081006	-2.637051	0.0217

Table 4: Long Run Estimates for Economic Growth Model

Selected Model: ARDL (1, 2, 2, 2, 2)				
Dependent Variable: LGDP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LREM	0.040854	0.014945	2.733734	0.0194
LHC	0.230783	0.034936	6.605976	0.0000
LGOV	-0.060407	0.032441	-1.862073	0.0895
LFDI	0.052801	0.007649	6.903326	0.0000
REGM	0.047942	0.027623	1.735551	0.1105
DROUT	-0.040325	0.016259	-2.480116	0.0306
C	4.820130	0.080065	60.202873	0.0000
T	0.076530	0.001432	53.445140	0.0000

Note: Significance at 1%,5% and 10% is shown by *, **and***

The Short Run Effect of Remittance on Private Investment & Economic Growth

Once the long-run coefficients of the models are estimated, the short-run models are estimated. Accordingly, the short run model results are presented in Table 7 and Table 8. The results obviously show that the ECT

the first year and it takes 1.27 years to fully converge towards its long-run equilibrium. Similarly, the error correction coefficient of the second model (economic growth model) is about -0.776 implying that about 77.6% of the disequilibrium could be corrected in one year. In other words, approximately 77.6 % of the disequilibrium from the previous

year's shock converges back to the long-run equilibrium in the current year.

Unlike the long run impact, international remittances do not have a significant impact on private investment and economic growth in the short run, though its coefficients are positive. This finding is consistent with Khan, et.al (2019). The short run insignificant impact of remittance on private investment may emanate from the reason that in the initial stages of migration, migrants usually try to smooth their level of consumption by spending more on basic necessities, such as shelter, food, and clothing, before they settle down and proceed towards saving and investment. After that they may start to save and invest in the long run, which is supported in the findings of this research

Table 5: Short Run Estimates for Private Investment Model

Selected Model: ARDL (1, 0, 1, 2, 1, 2, 1)				
Dependent Variable: Δ(INV)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔLREM	0.047400	0.053242	0.890277	0.3908
Δ LGDP	0.523582	0.250899	2.086829	0.0519
ΔLGOV	0.771398	0.351801	2.192710	0.0488
ΔLGOV (-1)	0.810185	0.363561	2.228471	0.0457
ΔLLIR	-0.907701	0.642269	-1.413271	0.1830
ΔLFDI	-0.011157	0.077987	-0.143057	0.8886
ΔLFDI (-1)	0.103643	0.038787	2.672088	0.0203
ΔLINF	-0.112614	0.570724	-0.197318	0.8469
REGM	0.053172	0.112875	0.471075	0.6460
ECT (-1)	-0.788339	0.299964	-2.628111	0.0221

Table 6: Short Run Estimates for Economic Growth Model

Selected Model: ARDL (1, 1, 2, 0, 0)				
Dependent Variable: Δ(GDP)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔLREM	-0.026556	0.014769	-1.798163	0.0996
ΔLREM (-1)	-0.028284	0.017583	-1.608620	0.1360
Δ LHCP	0.151014	0.032687	4.620035	0.0007
Δ LHCP (-1)	0.195009	0.034448	5.660928	0.0001
ΔLGOV	-0.013744	0.040504	-0.339312	0.7408
ΔLGOV(-1)	0.063693	0.035360	1.801297	0.0991
ΔLFDI	-0.018945	0.004458	-4.249323	0.0014
ΔLFDI(-1)	0.006428	0.006721	0.956363	0.3594
REGM	0.037183	0.018793	1.978525	0.0735
DROUT	-0.031276	0.010761	-2.906374	0.0143
T	0.059356	0.016225	3.658335	0.0038
ECT (-1)	-0.775586	0.212130	-3.656183	0.0038

Note: Significance at 1%,5% and 10% is shown by *, **and***

absence of such problem (Annex-Table C). This indicates that the model was good enough for the study of cointegration among the variables. In addition, the Ramsey's RESET test; Jarque-Bera Normality tests indicate that the model is correctly specified (have correct functional forms), the disturbance terms are normally distributed. Besides, the CUSUM and CUSUM of Squares plot confirmed that the parameters of the models are relatively stable over time

Conclusions and Recommendations

Conclusions

This research analyzed the role of remittances on private investment and economic growth in Ethiopia over the year 1991-2020. I applied Auto Regressive Distributed Lag model (ARDL) to achieve the aim of the study. After founding cointegration among the variables, the estimated results indicated that international remittance inflows have a significant positive effect on both private investment and economic growth in the long run. But its effect was found to be statistically insignificant in the short run, though the coefficients are positive. The long run finding of this research is consistent with "the optimistic view on remittance" which considers remittance as a positive contributor to investment and economic growth. On the other hand, the short run result of this paper supports the "the pessimistic view on remittance". Further, the long-run result of this paper is consistent with the findings of Nuredin (2018) and Yaekoba (2014).

The descriptive analysis also clearly shows that remittances inflow to Ethiopia is continuously declining after 2014, though the total number of migrants leaving the country is increasing. This could be mainly because of political instability and the current COVID-19 pandemic effect.

Recommendations

International remittance flows are significantly affecting investment and economic growth in Ethiopia, in the long run. Therefore, government needs to design policy scheme that aims to enhance more remittances inflows and leverage remittances for productive purposes. In general, policy makers should design a system that creates a faster and cheaper means of remittance transfer system in the formal financial institutions that overcomes the informal remittance transfer channels. In line with this, the government authorities should focus on creating prominent policy incentives to leverage remittances for productive purposes. Specifically:

First, the government should create conducive environment for diversification of the banking services and financial inclusion such as the use of mobile banking, internet

banking, and rural banking that will assimilate more remittance-recipient households from the informal financial sectors into the formal financial system.

Second, lowering the cost of sending remittances can maximize the effect of remittance on growth and development. The transaction costs of sending remittances in Ethiopia (6.9%) are much higher than the target specified by Sustainable Development Goal and the 2015 Addis Ababa Action Agenda (3 percent). This makes the remitters to depend on the informal sector operators. Therefore, policy makers should design a mechanism that helps to lower the costs and any barriers of official remittance channels to enhance the number of remittances flows through the informal sector. Encouraging Micro Finance Institutions (MFIs) and rural credit and saving institutions to penetrate the remittances market could help to push down the cost of remitting (through increasing competition in the financial market) and increasing the share of the formal financial sector. Again, policymakers must work to guarantee that remittance service providers do not face complications in partnering with correspondent banks.

Third, the government of Ethiopia and financial institutions should continue the current trend of encouraging the Diaspora community to support the country through using legal and formal financial institutions whenever sending their money. In addition, there should an alternative means that encourage individuals who strive to bring foreign currency through the formal system. In addition, policy makers must recognize the constructive role of migrants for inclusive growth and sustainable development in countries of origin and destination countries

Fourth, the difference between the black-market exchange rate and the official exchange rate in Ethiopia is high, mainly due to widespread black-market, political instability and money smuggling out of the country. This will definitely force the remitters to depend on the informal remittance channel. That means, the remitters may find it profitable to divert foreign exchange from the official to the illegal market. Therefore, the Ethiopian

government should effectively struggle to control the black-market exchange market and smuggling money out of the country.

Fifth, policy makers need to permit remitters or remittance recipients to hold saving accounts in foreign currency that give a migrant a premium interest rate on their deposit. The interest payment made on these deposits should be fully or partially exempted from taxation. In this regard, the concerned authorities are trying to introduce such kinds of monetary policy measures..

Sixth, a favorable investment climate that can spur remittance-driven investments should be designed by the authorities (such as investment commission, NBE and ministry of foreign affairs). Because, efforts to improve the productive use of remittances can be achieved more effectively through improvements in the overall investment climate, rather than a specific focus on measures for remittances inflows. These measures may include creating well-established incentive-based programs, including savings and investment facilities, tax discounts, provision of land freely or at a less lease rate. Such kinds of policy measures may enable overseas Ethiopians to enjoy incentives that include the right to own private lands for commercial and other productive investments activities.

Acknowledgments

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Annexes

Table-A: ARDL Bounds Test (for investment model)

Test Statistic	Value	k
F-statistic	4.085001	6

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Table-B: ARDL Bounds Test (for economic growth model)

Test Statistic	Value	k
F-statistic	12.28626	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	3.03	4.06
5%	3.47	4.57
2.5%	3.89	5.07
1%	4.4	5.72

Table C. Diagnostic test (investment model)

F-statistics and P-values	Types of Tests			
	$\chi^2 SC$	$\chi^2 H$	$\chi^2 N$	Ramsey Reset
Calculated F-statistics	0.0940	1.1622	0.1944	5.0056
P-values	0.9111	0.4021	0.9051	0.0649

Note: $\chi^2 SC$ = Breusch − Godfrey Serial Correlation LM Test, $\chi^2 H$ = Breusch-Pagan-Godfrey test for heteroscedasticity, $\chi^2 N$ = Jarque-Bera normality Test. Ramsey Reset test was performed based on the squared fitted values.

Table D. Diagnostic test (economic growth model)

F-statistics and P-values	Types of Tests			
	$\chi^2 SC$	$\chi^2 H$	$\chi^2 N$	Ramsey Reset
Calculated F-statistics	2.8085	0.9272	0.8331	0.7640
P-values	0.1247	0.5395	0.6404	0.4625

Note: $\chi^2 SC$ = Breusch − Godfrey Serial Correlation LM Test, $\chi^2 H$ = Breusch-Pagan-Godfrey test for heteroscedasticity, $\chi^2 N$ = Jarque-Bera normality Test. Ramsey Reset test was performed based on the squared fitted values.

Table E: Model Selection Criteria Table (Top 10 models)
Dependent Variable: LINV

Model	Log	AIC*	BIC	HQ	Adj. R-sq	Specification
578	28.658531	-0.904181	-0.142921	-0.671456	0.959287	ARDL(1, 0, 1, 2, 1, 2, 1)
497	29.276369	-0.876883	-0.068045	-0.629614	0.957503	ARDL (1, 0, 2, 2, 1, 2, 1)
335	29.114727	-0.865338	-0.056499	-0.618068	0.957010	ARDL (1, 1, 1, 2, 1, 2, 1)
569	29.031819	-0.859416	-0.050577	-0.612146	0.956754	ARDL (1, 0, 1, 2, 2, 2, 1)
587	26.729581	-0.837827	-0.124146	-0.619648	0.956867	ARDL (1, 0, 1, 2, 0, 2, 1)
577	28.707211	-0.836229	-0.027391	-0.588959	0.955740	ARDL (1, 0, 1, 2, 1, 2, 2)
254	29.599262	-0.828519	0.027898	-0.566703	0.954319	ARDL (1, 1, 2, 2, 1, 2, 1)
488	29.471937	-0.819424	0.036993	-0.557609	0.953902	ARDL (1, 0, 2, 2, 2, 2, 1)
326	29.358439	-0.811317	0.045100	-0.549502	0.953527	ARDL (1, 1, 1, 2, 2, 2, 1)

Table F: Model Selection Criteria Table (Top 10 models)
Dependent Variable: LGDP

Model	Log	AIC*	BIC	HQ	Adj. R-sq	Specification
82	83.012521	-4.715180	-3.906342	-4.467910	0.999068	ARDL (1, 2, 2, 2, 2)
83	81.939049	-4.709932	-3.948672	-4.477207	0.999077	ARDL (1, 2, 2, 2, 1)
1	83.020671	-4.644334	-3.787916	-4.382518	0.998975	ARDL (2, 2, 2, 2, 2)
88	80.018473	-4.644177	-3.930496	-4.425997	0.999023	ARDL (1, 2, 2, 0, 2)
89	78.977343	-4.641239	-3.975137	-4.437605	0.999023	ARDL (1, 2, 2, 0, 1)
2	81.947460	-4.639104	-3.830266	-4.391834	0.998994	ARDL (2, 2, 2, 2, 1)
85	80.534757	-4.609625	-3.848366	-4.376901	0.998980	ARDL (1, 2, 2, 1, 2)
86	79.086320	-4.577594	-3.863913	-4.359415	0.998956	ARDL (1, 2, 2, 1, 1)
7	80.022249	-4.573018	-3.811758	-4.340293	0.998942	ARDL (2, 2, 2, 0, 2)