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## **The Effects of Domestic Private Investment on Ethiopian Economic Growth: Time Series Analysis**

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Tale Geddafa<sup>1</sup>

**Abstract:**

**Purpose:** *The primary aim of this study is to examine the factors affecting domestic private investment and its effect on economic growth in Ethiopia. To meet its goal, the study used a quantitative research strategy.*

**Design/Methodology/Approach:** *Using the ARDL model and the relevant software, E-views version 12, the study concentrated on 31 years of secondary data (i.e., from 1992 to 2022).*

**Findings:** *The study's key finding demonstrates that domestic private investment was negatively and significantly impacted by the inflation rate, public investment, and real effective exchange rate over a period of both the short- and long-run. While Domestic credit to the private sector, foreign direct investment, real GDP and trade openness were found positive and significant effect on domestic private investment in long run. Unemployment rate was found positive and significant effect in short run but insignificant in long run. Annual interest rate was found negative significant effect in short run but insignificant in long run. While total government expenditure insignificant in both short and long run. Inflation has a negative relation with domestic private investment in both short and long run, therefore the study suggested that policymakers should recognize the cause for fluctuations in inflation and keep in a stable manner.*

**Practical Implications:** *An important factor in a nation's economic development is investment activity. The ability of a nation to invest and use its resources effectively and productively is a major factor in economic growth. Although, Domestic private investments are crucial for economic growth, its expansion in Ethiopia is still in its early stages.*

**Originality/Value:** *The study recommended that since inflation has a negative relation with domestic private investment in short run and long run, policymakers should understand the cause for inflation volatility and keep in a stable manner.*

**Keywords:** *Domestic private Investment, ARDL Model, Macroeconomic Variables, Time Series analysis, Ethiopia.*

**JEL Classification:** *O0, O40.*

**Paper type:** *Research article.*

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<sup>1</sup>Dr., Ambo University Economics, Ethiopia, [gedefa44@gmail.com](mailto:gedefa44@gmail.com);

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## 1. Introduction

Private investment in general and domestic private investment in particular plays a vital role in expanding the productive capacity of the economy and promoting the long term economic growth (World Bank Group, 2013). Bakaren (2011), define investment to be an operation involving the purchase of items that will be used right away rather to consume immediately. It is an act of current spending for expected future return. According to Sachs (2005), investment is the accumulation of newly produced physical entities, such as factories, machinery, houses, goods, and inventories.

Empirically, countries that were able to accumulate high levels of investment achieved faster rates of economic growth and development (Akçay and Karasoy, 2020). One of the key parameters that divide industrialized countries from a developing country is their degree of investment. Investment is the major foundation of enhancement in the level of literacy, improvement in technology and increase in the capital stock (Nwankwo and Allison, 2021).

Investment activities can be done by two main sectors, public and private. Majority of public investment commonly focused to finance physical and non-physical development infrastructure which could not be conducted by society (Organisation for Economic Co-operation and Development (OECD, 2016).

However, private investment, both foreign and domestic, increases the productive capacity, creates employment opportunities, promotes technical advancement, raising growth rates, increasing export and introducing innovations, and reduces poverty in the country (World Bank, 2019). The private investment is a crucial pre-requisite for economic growth because it allows entrepreneurs to set economic activity in action by making resources together to produce goods and services (Bayai and Nyangara, 2013).

The government of Ethiopia follows an integrated 5 year development plan, preparing the GTP II five year program (2015/16–2020/21) as well as achieve the Sustainable Development Goals and attain middle-class income status by 2025 in which private investment has play great role(Investment Climate Statement (EIC, 2017). The country is making a concerted effort towards structural transformation where manufacturing (especially investment) is expected to play a noticeable role in the economy (World Bank, 2016).

The country is taking steps to make the private sector to by targeting to reduce its interest rate, provides investment incentive and expanding access to medium and long-term finance (EIC, 2019). Ethiopian Investment Commission has also doing on enhancing the growth of the private business by creating an enabling environment both in the domestic and foreign markets (MoFEC, 2018).

According to the Ethiopian Investment Commission (EIC, 2021), a total of 113,127 private sector investment projects were registered across all regional states and city administrations between 1991/2002 and mid-2021. Among the projects, the majority of the investment is owned by domestic private investors (94.75%) (107,189 projects), and the remaining 5.25% (5,938 projects) is owned by foreigners.

Of the total investment projects registered, 7.87% or 8,901 projects are in the implementation stage, 43,363 projects, or 38.33%, have launched operations, while the remaining 59,400 projects, or 52.5%, are pre-implementation (licensed investment) projects by mid-2021. This means that less than half (46%) of the total registered private investment projects are converted into actual investments, indicating the slow pace of implementation of private sector investment projects.

In Ethiopia, foreign private projects are capital incentive while domestic private projects have higher share in employment creation (Malela and Abdula, 2022). Investment in the country shows progressive trends with speedy starting from announcement of liberal policy in 1992. Even if the situation of investment has improved from the previous period, the participation of private sector is not satisfactory (Ago, 2020). Even though the country has favorable investment climate, the growth of domestic private investment is remain very low (World Bank, 2020).

Ethiopia's public investment rate is the third highest in the world, but private investment rate is the sixth lowest (World Bank, 2018). Macroeconomic variables are highly affecting the growth and performance of domestic private investment. After the introduction of the current government; Prosperity Part, through lifting various challenges, Ethiopia tries to give support for the domestic private investment.

Though growing, as compared to the public infrastructure boosting, the expansion of domestic private investment is still at its infancy (Ethiopian Investment Commission (EIC, 2021). This indicates that the government is so much concerned about policies to boost private investment without much knowledge on the factors that could influence domestic private investment.

Various studies have been done related to this topic in Ethiopia. Most of them (Waktola, 2020; Legass *et al.*, 2022; Kibret, 2018; Kassahun, 2021; Esubalew, 2014) are studied about macroeconomic determinants of private investment using secondary data and VAR Model. However, they draw contradicting conclusions on some variables such as inflation, and interest rate are positive effects on private investment. Other studies focus on the determinants of public investment (Adugna, 2013; Tilahun, 2021) and they state private investment as one of the explanatory variable.

Shiferaw (2016) examined both macro and microeconomic determinants of private investment in Ethiopia at regional level using primary data. However, it is important

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to study the determinants of private investment at country wise because all policy review, evaluation and corrections are made at national level. Some of them (Aklilu, 2021; Saxena, 2021; Abinet, 2022; Waktole and Bogale, 2018) are even based on primary data that are collated from specific town and city of Jimma City, Dire Dawa City, Debre Tabor Town and Finoteselam and Bure Towns, respectively, which cannot conclude the determinants and the effects of private investment as country wise.

Others studies like Teklay (2017) only focus on financial determinants of private investment using time series data. However, he missed other influential variables like government expenditure, unemployment rate and, domestic credit to the private sector and public investment.

In knowledge of researcher's reviewing the previous literatures, there is only one published study (Abate, 2016) to date that address macroeconomic determinants of domestic private investment in Ethiopia by using VAR model from the time period of 1971 to 2014. Though his study was related to this study than the others, he is missing important variables that might extremely determine domestic private investment in Ethiopia like external debt service, government expenditure, unemployment rate and Foreign Direct Investment (FDI).

He also used VAR model to analyze the data, however, it is advised if ARDL model is used for analyzing of determinant variables as most of previous studies are used it. For the reason that ARDL model uses a combination of endogenous and exogenous variables, unlike a VAR model that's strictly for endogenous variables.

Accordingly, the existence of contradicting conclusions, and adding irrelevant or omission of relevant variables in the previous studies initiates the researcher to another new investigation. Hence, in depth investigation of these missed variables incorporating with others is required by using the ARDL model from the time period of 1992 to 2022. Since the effect of such variables varies depending on the time period covered (due to the nature of the variables has short and long-run effects) and methodology followed.

This study is thus an effort to fill up this gap in knowledge and provide recent information regarding the effects and determinants of domestic private investment in Ethiopia by adopting relevant analytical methodology (ARDL model) through using macro-economic variable such as real GDP, real effective exchange rate, lending interest rate, external debt service, trade openness, average annual inflation rate, domestic credit to the private sector, unemployment rate, total government expenditure and foreign direct investment.

The main objective of this study is therefore to analyse the effects and determinants of macroeconomic factors that influence development of domestic private investment in Ethiopia from the period 1992/93 to 2021/22 based on secondary data.

## **2. Research Methodology**

### **2.1 Research Design**

A research design is a master plan that specifies the methods and procedures for measurement and analyzing the needed information (Abbott and McKinney, 2013). The study was used quantitative research design to investigate the effects and determinants of domestic private investment in Ethiopia. The study uses secondary data which is readily available for convenience, in terms of time available. 31 years data (i.e., from 1992 to 2022) were gathered for some important variables. The collected secondary data was summarized using tables and graphs. Then, the data were analyzed using ARDL model.

### **2.2 Data Types and Sources**

The study was used the annual time series data over the period of 1992/93 to 2021/22. The secondary data was gathered from World Bank Database, National Bank of Ethiopia (NBE) and Ethiopian Investment Commission (EIC) for macroeconomic variables.

### **2.3 Method of Data Analysis**

#### **2.3.1 Econometric Analysis**

The study used ARDL model in order to assess the short run and long-run effects of independent variables on dependent variable. Econometric time series estimation technics was used and analyzed using EVIEWS version 12 statistical software package (Thalassinos and Pociovalisteanu, 2007).

#### **2.3.2 Model Specification**

The theoretical and empirical evidences suggest that there is no one model that specifies the determinants of domestic private investment. Models such as Keynesian, neoclassical and neo-liberal alone cannot determine the domestic private investment. Hence, the study used an eclectic time series model that was adopted by Asante (2000) which is also applied by previous studies like Ajide *et al.* (2012) and Acosta and Loza (2010).

The theoretical explanations and previous empirical evidences suggest that past performance of the independent variable affects the current or past performance of the explanatory variables (Ouattara, 2004). Hence, the nature of the model that we use is an Autoregressive Distributive Lag Model (ARDL). Pesaran *et al.* (2001) bounds testing approach will be used to identify the long-run determinates since this approach has some econometric advantages over other approaches.

Some of the advantages of this approach are: First, tests can be conducted whether they are purely co-integrated at (I(0)), (I(1)) or mutually co-integrated (Pesaran *et*

*al.*, 2001). Second, it reduces serial correlation and endogeneity problems. Third, using ARDL bound test has the ability to minimize deficiencies related with a mixture of different integration levels. Fourth, ARDL bound test approach estimate the long and short-run parameters of the model simultaneously. Fifth, Autoregressive Distributed Lag (ARDL) approach to co-integration helps in identifying the co-integrating vector(s) and if one co-integrating vector is identified the ARDL model of the co-integrating vector is re-parameterized into ECM.

The re-parameterized result gives short-run dynamics and long run relationship of the variables of a single model. In addition, ARDL approach is preferable if some explanatory variables are exogenously determined Johanson (1988).

Hence, to operate the above theoretical model, a basic eclectic flexible accelerator functional model, the following empirical function incorporating macroeconomic variable is formulated. The variables are chosen based on the availability of data and the existence of wide literatures. The 12 macroeconomic variables in which 11 are explanatory variables are incorporated in the following equation as:

$$PINV_t = f(RGDP, PUINV, AIR, REER, OPEN, IR, CREDIT, EXPEN, FDI, UNEMP) \quad (1)$$

The model explains that domestic private investment (PINV) is subject to changes in real GDP, Public Investment(PUINV), Annual Inflation Rate(AIR), Real Effective Exchange Rate (REER), Trade Openness (OPEN), Annual lending interest rate (IR), External Debt service (DEBT), domestic credit to the private sector (CREDIT), Unemployment Rate(UNEMP), Total Government expenditure(EXPEN) and Foreign Direct Investment (FDI). Therefore, the general ARDL model specified as follows:

$$Y_t = \alpha + \sum_{i=0}^p \beta_i Y_{t-1-i} + \sum_{i=0}^p \beta_j X_{it-i} + \mu_t \quad (2)$$

Where,  $\alpha$  is a constant,  $Y_t$  is endogenous variable,  $X_{i,t}$  is the  $i$ th explanatory variables,  $p$  is the maximum lag number to be used,  $\beta_i$  and  $\beta_j$  are parameters, and  $\mu_t$  is the white noise error. So when we apply the variables in to equation, the function becomes in the form of:

$$\begin{aligned} \Delta PINV_t = & \alpha_0 + \sum_{i=1}^p \beta_1 RGDP_{t-1} + \sum_{i=0}^p \beta_2 PUINV_{t-1} + \sum_{i=0}^p \beta_3 AIR_{t-1} + \\ & \sum_{i=0}^p \beta_4 REER_{t-1} + \sum_{i=0}^p \beta_5 OPEN_{t-1} + \sum_{i=0}^p \beta_6 IR_{t-1} + \sum_{i=0}^p \beta_7 DEBT_{t-1} + \\ & \sum_{i=0}^p \beta_8 CREDIT_{t-1} + \sum_{i=0}^p \beta_9 UNEMP_{t-1} + \sum_{i=0}^p \beta_{10} EXPEN_{t-1} + \sum_{i=0}^p \beta_{11} FDI_{t-1} + \mu_t \end{aligned} \quad (3)$$

Where: PINV is Domestic Private Investment, RGDP is Real Gross Domestic Product, PUINV is Public Investment, AIR is Annual Inflation Rate, REER is Real

Effective Exchange Rate, OPEN is Trade Openness, IR is Annual lending interest rate, DEBT is External Debt service, CREDIT is Domestic Credit to the private sector, UNEMP is Unemployment Rate, EXPEN is Total Government expenditure and FDI is Foreign Direct Investment.

### **2.3.3 Model Estimation procedures**

**Diagnostic Tests:** To select appropriate model, the study have go through certain steps such as pre-estimation test including Unit root test, Co-integration test and maximum lag length, and post estimation test which include stability test, normality test, auto-correlation test, heteroscedasticity test, multicollinearity test and model misspecification test to ensure that the data fits the basic assumptions of the ARDL model.

**Unit Root Test:** Even though the classical regression model assumes that both the dependent and independent variables are to be stationary over time, most economic variables exhibit long-run trend movement and only become stationary after they are differenced (Alemayehu *et al.*, 2012). A data series is said to be stationary if its error term has zero mean, constant variance and the covariance between any two time-periods depends only on the distance or lag between the two periods and not on the actual time which it is computed (Harris, 1995).

Several tests are usually employed to test whether time series variables are stationary or non-stationary such as Dickey-Fuller (DF), Augmented Dickey-Fuller (ADF) test, Phillips-Peron test and Auto-Correlation Function (ACF) test. In this study, the Augmented Dickey-Fuller (ADF) test and Phillips-Peron test were applied to determine the existence of a unit root. Basically this test has been chosen for its consistency, accuracy and resourcefulness.

## **2.4 Selecting Optimal Lag Length**

Before estimating the MODEL, we have to decide the maximum lag length, to generate the white noise error terms. To determine the optimal lag length different information criteria can be used. The objective of the information criteria (IC) method is to select the number of parameters, which minimize the value of the information criteria (Brooks, 2008).

The most popular information criteria's are the Akaike information criterion (AIC), Schwarz information criteria (SIC) and the Hannan-Quinn information criterion (HQIC). According to Kaputo (2011), the model having low SIC is better.

## **2.5 ARDL Bounds Testing (Co-Integration Testing)**

The concept of Co-integration is functional to a wide variety of economic models. Any equilibrium relationship among a set of non-stationary variables implies that the variables cannot move independently of each other. These linkages among the

stochastic trends necessitates that the variables are co-integrated. Co-integration among the variables reflects the presence of long run relationship in the system. In general, we need to test for co-integration because differencing the variables to attain stationary generates a model (Pesaran and Shin, 1999).

Thus, in order to examine the long-run relationship and dynamic interaction between domestic private investment development and its determinants our study employs an ARDL modeling approach. According to Pesaran *et al.* (2001) the ARDL approach requires three steps: The first step is done by testing the significance of the lagged levels of the variables in the error correction form of the underlying ARDL model.

Thus, according to Pesaran *et al.* (2001) the dependent variable must be (I(1)), but the explanatory variables can be either (I(0)) or (I(1)). Hence, the equation (3) above can be reformulated in terms of differences and lagged levels. In addition, to separate the short-run and long-run multipliers of the model, we add error correction model (ECM). Therefore, the error correction version of the ARDL model is:

$$\begin{aligned} \Delta \ln \text{PINV}_t = & \alpha + \sum_{i=1}^p \beta_1 \Delta \ln \text{RGDP}_{t-1} + \sum_{i=0}^p \beta_2 \Delta \ln \text{PUNV}_{t-1} + \sum_{i=0}^p \beta_3 \Delta \ln \text{AIR}_{t-1} + \\ & \sum_{i=0}^p \beta_4 \Delta \ln \text{REER}_{t-1} + \sum_{i=0}^p \beta_5 \Delta \ln \text{OPEN}_{t-1} + \sum_{i=0}^p \beta_6 \Delta \ln \text{IR}_{t-1} + \sum_{i=0}^p \beta_7 \Delta \ln \text{DEBT}_{t-1} + \\ & \sum_{i=0}^p \beta_8 \Delta \ln \text{CREDIT}_{t-1} + \sum_{i=0}^p \beta_9 \Delta \ln \text{UNEMP}_{t-1} + \sum_{i=0}^p \beta_{10} \Delta \ln \text{EXPEN}_{t-1} + \\ & \sum_{i=0}^p \beta_{11} \Delta \ln \text{FDI}_{t-1} + \lambda_1 \ln \text{PINV}_{t-1} + \lambda_2 \ln \text{RGDP}_{t-1} + \lambda_3 \ln \text{PUNV}_{t-1} + \\ & \lambda_4 \ln \text{AIR}_{t-1} + \lambda_5 \ln \text{REER}_{t-1} + \lambda_6 \ln \text{OPEN}_{t-1} + \lambda_7 \ln \text{IR}_{t-1} + \lambda_8 \ln \text{DEBT}_{t-1} + \\ & \lambda_9 \ln \text{CREDIT}_{t-1} + \lambda_{10} \ln \text{UNEMP}_{t-1} + \lambda_{11} \ln \text{EXPEN}_{t-1} + \gamma \text{ECM}_{t-1} + \mu_t \end{aligned} \quad (4)$$

Where:  $\Delta$  is the first difference of a variable;  $\beta_1 \dots \beta_{11}$  represent the short-run coefficients;  $\lambda_1 \dots \lambda_{11}$ , represent to the long-run coefficients; ECM correspond to error correction model, and  $\gamma$  represents the speed of adjustment process of the ECM. The coefficient of the lagged error correction model is expected to be negative and statistically significant to support further the existence of a co-integrating relationship.

## 2.6 Description of Variables

**Dependent Variable:** The dependent variable used in this study was domestic private investment which could be measured by Private Investment as a Percentage of GDP.

**Independent Variables:** Based on the checkup of the existing related literatures, and the researcher's knowledge, the major independent variables are selected such as RGDP, Public Investment, Annual Inflation Rate, Real Effective Exchange Rate, Trade Openness, Annual Inflation Rate, External Debt service, domestic credit to the private sector, Unemployment Rate, Total Government expenditure and Foreign Direct Investment.



***Real Gross Domestic Product:*** Real GDP is used to capture the aggregate demand conditions in the economy or it measures the size of the host market which represents the host country's economic conditions and the potential demand for output. The growth of GDP highly contributes to private investment development (Fielding, 1997; Shuaib *et al.*, 2014; Batu, 2016). Therefore, real GDP is expected to exert a significant and positive effect on private investment.

***Public Investment:*** Public investment has an ambiguous priority effect on domestic private investment. The role of public investment is seen from two aspects. On one hand, public investment may crowd-out private investment via increased deficits and a high interest rate; in turn, it reduces the amount of money available for private sectors (Nibret, 2018). On the other hand, public investment may act as a crowding-in catalyst through the provision of key infrastructure and it promotes private sector expansion and development (Escaleras and Kottaridi, 2014; Ambe, 2013; Lemma and Woldemariam). Thus, at the theoretical level, the effect of public investment is ambiguous.

***Annual Lending Interest Rate:*** It is an interest rate that has been adjusted to remove the effects of inflation to reflect the real cost of funds to yield to the real lender or to an investor. To avoid purchasing power erosion through inflation, investors consider the real interest rate, rather than the nominal interest rate. At a higher interest rate investment declines and at a lower interest rate investment rises. Hence, the effect of interest rate on private investment is expected to be negative and this is supported by a study by Nibret (2018).

***Real Effective Exchange Rate (REER):*** It represents the nation's nominal effective exchange rate adjusted for inflation in the home country and used as a proxy to measure macro-economic stability. It is a measure of the value of a currency against a weighted average of several foreign currencies. It is an indicator of the external competitiveness of a country's currency (Branson and Buffy, 1986). Thus, the effect of the real exchange rate on private investment is ambiguous.

***Trade Openness:*** It is a proxy for economic openness (international trade). The trade openness index is one measure of the extent to which a country is engaged in the global trading system and allowing foreign firms to do business in its domestic market. It is usually measured by the ratio between the sum of exports and imports and gross domestic product (GDP) (Dollar and Kraay, 2003). In this study, the impact of trade openness on private investment is expected to be positive.

***Annual Inflation Rate:*** This is another important variable of macroeconomic stability indicators which may affect private investment. It represents changes in the general price level or inflationary conditions in the economy (Elbadawi and Mwega, 1997). In this study, the impact of inflation rates on private investment is expected to be negative.

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**External Debt Service:** External debt service is measured by debt service ratio to export receipts, the ratio of external debt to export receipts and the ratio of external debt to GDP (Onoh, 2013). The sign associated with External Debt as a Percentage of GDP is expected to be positive.

**Domestic Credit to the Private Sector:** Access to finance is an impediment to increased Ethiopian domestic private investment. While credit is available to investors on market terms, a 100% collateral requirement limits the ability of some investors to take advantage of business opportunities. In this study, the impact of domestic credit on domestic private investment is expected to be positive.

**Unemployment Rate:** The unemployment rate is the percentage of the labor force without a job. It is a lagging indicator, meaning that it generally rises or falls in the wake of changing economic conditions, rather than anticipating them. In this study, the impact of unemployment on private investment is expected to be negative.

**Total Government Expenditure:** Total expenditure consists of total expense and the net acquisition of non-financial assets. In this study, the impact of foreign direct investment on private investment is expected to be negative.

**Foreign Direct Investment:** It is a foreigner or an enterprise wholly owned by foreign nationals, having invested foreign capital in Ethiopia or a foreigner or an Ethiopian incorporated enterprise owned by foreign nationals jointly investing with a domestic investor, and includes an Ethiopian permanently residing abroad and preferring treatment as a foreign investor. In this study, the impact of foreign direct investment on private investment is expected to be positive.

### 3. Results and Discussion

#### 3.1 Descriptive Statistics

Table 1 shows that the mean value of domestic private investment is 2.48806 while public investment is 2.736766 in Ethiopia, meaning that the average value of domestic private investment (2.48%) is less developed than public investment (2.745). However, the variation is very less. Real GDP is one of the most primary economic healths of the country. If GDP grows, the likelihood of selling manufacturing products also grows and domestic private investments are likely to benefit from that in form of higher profits.

The mean value of GDP across the study periods has 8.964516 and the standard deviation has 2.514829 which indicate that there is a good variation in the value of GDP rate across the study years. The maximum and minimum values have 12.6000 and 1.60000, respectively (Table 1). The mean value of exchange rate for domestic private investment during the study period is about 15.51160 and the value of standard deviation is 12.85085 which imply that 15.51 percent of average of

Ethiopian birr per USD and the presence of good variation among the USD across the study period included for this study. Exchange rate is easily monitored and provides good collaterals. The maximum and minimum values were 52.07480 and 2.07000 respectively (Table 4.1). The mean value of external debt service for domestic private investment during the study period is about 8.047744 and the value of standard deviation is 1.427786 which indicates that there is a good variation in the value of external debt service across the study years. The maximum and minimum values have 11.46570 and 6.234782, respectively (Table 4.1).

**Table 1. Summary of descriptive statistics of the study variables**

	LNFDI	LNAIR	LNCREDIT	LNDEBT	LNEXPE N	LNINV	LNPUI N	LNRGDP	LNREER	LNRI	LNOPEN	LNUNE MPL
Mean	0.29855	11.3389	25.33114	8.047744	17.31026	2.48806	2.736766	8.964516	15.51160	4.480968	4.911303	4.496742
Median	0.15000	9.56890	25.30000	7.473063	17.48371	2.66000	2.529195	9.900000	8.794300	6.740000	4.937224	4.55600
Max.	0.97600	33.2499	38.69165	11.46570	23.14907	5.58000	4.219365	12.60000	52.07480	17.64000	5.842147	6.64700
Min.	0.01000	-8.4842	10.9000	6.234782	12.35597	0.01000	1.87194	1.60000	2.07000	-17.1200	4.54100	3.436000
Std. Dev.	0.29263	9.72029	7.623976	1.427786	2.81008	1.77681	0.552538	2.514829	12.85085	7.518612	0.266236	0.898018
Skewness	1.24034	0.46879	-0.02438	0.824198	0.279433	0.10887	1.025594	-1.34473	1.568332	-0.96369	1.27695	0.617423
Kurtosis	3.1784	3.37273	2.46085	2.528518	2.878859	1.75928	3.738062	4.939912	4.617528	3.709355	5.88090	2.70007
Observations	31	31	31	31	31	31	31	31	31	31	31	31

*Source: Own computation using Eviews 12*

### 3.2 Trends of Private Investment in Ethiopia

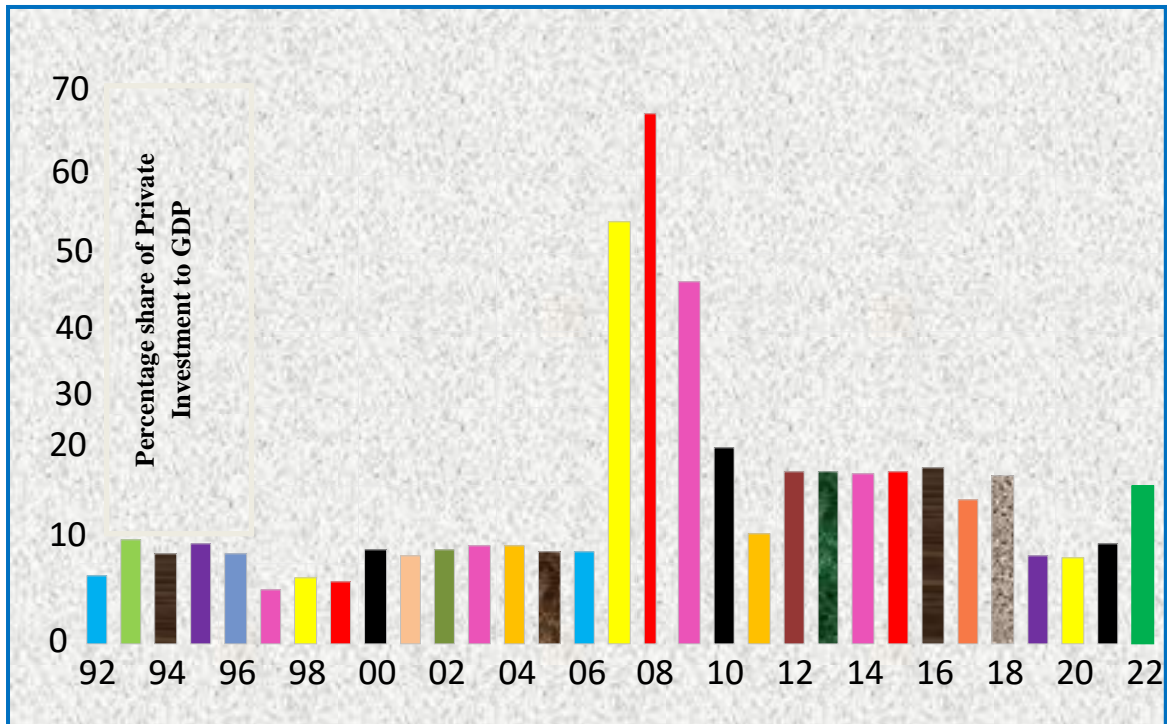
As shown in the below Figure 1, domestic private investment in Ethiopia increase throughout the year due to good investment climate for the investor and suitable investment policy. Nevertheless, in 1997(6.5009%), the trend shows that there is a downfall of domestic private investment due to high inflationary rate and then starts to rise in 2000 (11.847%).

The domestic private investment as a percentage share of GDP show different trends in Ethiopia from 8.4308% of GDP in 1992 to the end of period specified in this study 20.0245% of GDP in 2022. In the period the maximum amount 67.99% registered in 2008, while the minimum 6.50% in 1997. In the study period on average the percentage share of private investment to GDP is 17.34%, the Ethio-Eritrean war period (1998-1999) registered a smallest while the Ethiopian millennium year (2008) largest share of domestic private investment shown (Figure 1).

The percentage share of domestic private investment to GDP in Ethiopian was declined between 2019 (21.4325%) to 2021 (12.5434%) for the reasons of COVID-19 pandemic disease, political tensions, and a devastating conflict in the Tigray region (Figure 1). The economic impact of COVID-19 includes the increased price of basic foods, rising unemployment, a slowdown in growth, and an increase in poverty.

An underdeveloped private sector investment would limit the country's trade competitiveness and resilience to shocks (World Bank, 2021). According to the Primary Manufacturing Survey (2020), 84.64% of the interviewed domestic private sector investors reported that COVID-19 adversely affected their investment (EIC, 2021). In general, the last three years record (2019-2021) shows a minimum development of domestic private investment in the country relative to the 2018 (21.4326%).

**Figure 1.** Trends of Domestic Private Investment in Ethiopia from the period of 1992 to 2022



*Source: Author computation; from various years' report of EIA and MOFEC*

### 3.3 Econometric Results

#### 3.3.1 Unit root test results

The primary step before starting the empirical analysis is to test for stationary properties of the effects and determinants of domestic private investment to check whether a series is stationary or not. Because using the classical estimation methods to estimate relationships with non-stationary variables results in spurious regression (Gujarati, 2004).

If the variables are all stationary in level, we apply an estimate based on a linear regression. On the other hand, if the variables are all stationary into the first

difference, our estimates are based on an estimate of the ARDL model (Pesaran *et al.*, 2001).

To test for stationarity, the study utilizes the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root test. The results of the stationarity tests in levels and at first difference for all the variables are presented in Table 2. The ADF (1981) and PP (1988) statistic used is a negative number. The more negative, indicates the stronger the rejection of the hypothesis.

The results indicate that most variable such domestic private investment (in both ADR and PP), annual inflation rate (in PP), government total expenditure (in PP), Foreign Direct Investment (in PP), public investment (in both ADR and PP), Real GDP (in both ADR and PP), interest rate (in both ADR and PP) and Trade openness (in both ADR and PP) were stationary at the level (Table 2). It implies that the t-statistics is greater than the t-critical value at 5% significant level.

However, some variables that include domestic credit to the private sector, unemployment and external debt stock were non-stationarity at level (Table 2). A variable is non-stationary if the estimated ADF and PP test is smaller than the critical value in absolute terms and vice versa.

This means some variables have to be differenced to make them stationary. The results show that the ADF and PP t-statistics exceeded the t-critical value at 5% significant level for all the variables at first difference (Table 2).

The implication is that all the variables are found to be stationary at first difference. The null hypothesis stated that data are non-stationary, or contains a unit root is rejected at 5% significance level. All the variables included in the model were found to be stationary at either I (0) or I (1), therefore the analysis can be performed Co-integration test using the ARDL bounds testing approach.

### **3.3.2 Maximum Lag Selection**

Cointegration test is usually preceded by a test of optimal lag length selection because of the test is affected by the number of lags included in the ARDL model (Smith, 2001).

The maximum lag length for this study was determined by using the Schwarz information criteria (SIC) as this method has been confirmed in most empirical studies to be superior to other tests.

The values indicated by astrix (\*) that shows lag order that are selected by criterion at 5% level of significance. As indicated in Table 3 below the optimal lag length for this study is the SC 1. Because the lag order that has many number of astrix is more optimal than few astrix (Pesaran *et al.*, 2001).

**Table 2.** Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Unit Root Test for stationarity

Variables	Augmented Dickey-Fuller			Phillips-Perron (PP)		
	ADF t-statistics	t- critical value at 5%	P-Value	PP statistic	t- critical value at 5%	P-value
LNPINV in level	-5.5595	-2.963972	0.0001***	-5.8602	-2.96397	0.0000***
LNPINV in 1 <sup>st</sup> Difference	-8.98713	-2.967777	0.0000***	-24.4021	-2.9677	0.0001***
LNAIR in level	-1.5120	-2.9677	0.5137	-4.17116	-2.96397	0.0029***
LNAIR in 1 <sup>st</sup> Difference	12.14261	-2.96776	0.0000***	-16.253	-2.96776	0.0000***
LNCREDIT in level	-2.4349	-2.963972	0.1412	-2.50435	-2.96397	0.1245
LNCREDIT in 1 <sup>st</sup> Difference	-6.27234	-2.96776	0.0000***	-6.25421	-2.96776	0.0000***
LNDEBT in level	-2.00183	-2.963972	0.2845	-2.04192	-2.96397	0.2684
LNDEBT in 1 <sup>st</sup> Difference	-5.98707	-2.96776	0.0000***	-5.99918	-2.96776	0.0000***
LNEXPEN in level	-1.17066	-2.971853	0.6726	-3.61365	-2.96397	0.0115**
LNEXPEN in 1 <sup>st</sup> Difference	-4.15865	-2.98103	0.0035***	-15.72590	-2.96776	0.0000***
LNFDI in level	-1.49838	-2.99806	0.9987	-4.28929	-2.96397	0.0021***
LNFDI in 1 <sup>st</sup> Difference	-5.15622	-2.99804	0.004***	-12.7604	-2.96776	0.0000***
LNUINV in level	-5.27545	-2.96397	0.0002***	-5.28173	-2.96397	0.0002***
LNUINV in 1 <sup>st</sup> Difference	-9.07305	-2.96776	0.0000***	-24.87820	-2.96776	0.0001***
LNREER in level	-1.95572	-2.96776	0.3036	-2.6660	-2.96397	0.0917*
LNREER in 1 <sup>st</sup> Difference	-6.15935	-2.971853	0.0000***	-21.3491	-2.96776	0.0001***
LNRGDP in level	-5.36714	-2.96397	0.0001***	-5.67184	-2.96397	0.0001***
LNRGDP in 1 <sup>st</sup> Difference	-5.99774	-2.971853	0.0000***	-10.1229	-2.96776	0.0000***
LNRI in level	-5.01479	-2.96776	0.003***	-7.14651	-2.96397	0.0000***
LNRI in 1 <sup>st</sup> Difference	-5.52781	-2.98103	0.0001***	-26.31	-2.96776	0.0001***
LNTOPEN in level	-4.51603	-2.96397	0.0012***	-4.18526	-2.96397	0.0028***
LNTOPEN in 1 <sup>st</sup> Difference	-9.23444	-2.96397	0.0000***	-26.3138	-2.96776	0.0001***
LNUNEMP in level	-0.86072	-2.97185	0.7855	-3.153969	-2.96397	0.0331
LNUNEMP in 1 <sup>st</sup> Difference	-8.21828	-2.97185	0.0000***	-8.463707	-2.967767	0.0000***

**Note:** \*\*\*, \*\* and \* denote statistical significance at 1%, 5% and 10% levels, respectively.

**Source:** Own Estimation using E-view 12.

**Table 3.** Optimal Lag Length Selection criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
Zero	-54.11436	NA	0.000746	4.151025	4.341340	4.209207
One	-22.94798	52.20189*	0.000257*	3.067713*	4.019288*	3.568619*
Two	-7.131624	21.46506	0.000281	3.080830	4.793665	3.604461

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Three	3.716135	11.62260	0.000503	3.448848	5.922942	4.205203
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**Note:** \* Indicates lag order selected by the criterion, LR: Sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, HQ: Hannan-Quinn information criterion

**Source:** Own study.

### 3.3.3 Bound Tests for Cointegration

There is a long-run relationship among all the variables at the time of their F-statistic values are greater than the upper-bound critical value at the 5% level (Pesaran *et al.*, 2001). Accordingly, the results show that the computed F-statistic of 12.38438 is greater than the upper critical bound value of 3.04 at 5% significant level (Table 4). This indicates that the variables are cointegrated. Therefore, the study rejects the null hypothesis of no cointegration and decides that there exists a long-run equilibrium relationship between domestic private investment and the explanatory variables.

**Table 4.** Bound test result for co-integration analysis

Critical value	Lower Bound Value, I(0)	Upper Bound Value, I(1)
1%	2.41	3.61
5%	1.98	3.04
10%	1.76	2.77
Model	F-Statistic	Cointegration Status
F <sub>PINV</sub> (PINV/Y, AIR, CREDIT, DEBT, EXPEN, FDI,M2, PUINV,REER, RGDP,RI, TOPEN and UNEMP)	12.38438** K= 11	Cointegrated

**Notes:** \*\* denote statistical significance at 5% level.

**Source:** Own computation by using E-views 12(2023).

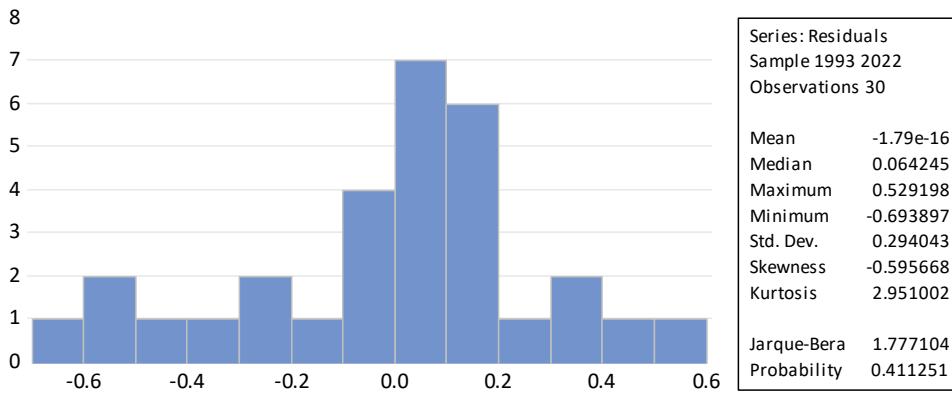
## 3.4 Results of Post-Estimation Diagnostic Test

It is mandatory to test the econometric assumptions in order to know the proposed model statistical good fit. To accept this model as a good one, the study conducted post estimation tests such as normality, Model Misspecification, stability, Auto-correlation, heteroscedasticity, and Multicollinearity.

### 3.4.1 Normality Test

The most commonly applied test for normality is the Jarque- Bera (JB) test. The JB uses the property of normally distributed random variable that the entire distribution is characterized by the first two moments, those are mean and variance. As shown in the graph, the result of Prob Chi =0.411251 >  $\alpha = 5\%$  or 0.05.

Since, the histogram is bell-shaped and JB statistic is not significant, which means P-value given at the bottom of the normality test should be > 5%, so it is bigger than it and normal (Figure 2). Thus, the null hypothesis (Ho= Error terms are normally distributed) cannot be rejected rather it is accepted. Therefore, it is concluded that error term of the model is normally distributed.

**Figure 2. Normality Test result**

*Source: Own computation using Eviews 12.*

### 3.4.2 Model Misspecification Test

To test the Misspecification Ramsey RESET Test was used. Ramsey testis used to check whether there is an omitted variable or not in the model besides, the specification error of incorrect functional form and correlation between explanatory variables and error term will be tested (Spara, 2005). The test reports the p-value of F-statistic, t-statistic and likelihood ratio should be greater than 5% significance level (0.3291, 0.3291 and 0.0513  $>\alpha=5\%$  or 0.05) (Table 5). Therefore, the conclusion of the test is the model is free from misspecification.

**Table 5. Ramsey RESET Test**

	Value	Df	probability
t-statistic	1.039188	8	0.3291
F-statistic	1.079911	(1,8)	0.3291
Likelihood Ratio	3.798686	1	0.0513

*Source: Own computation using Eviews 12.*

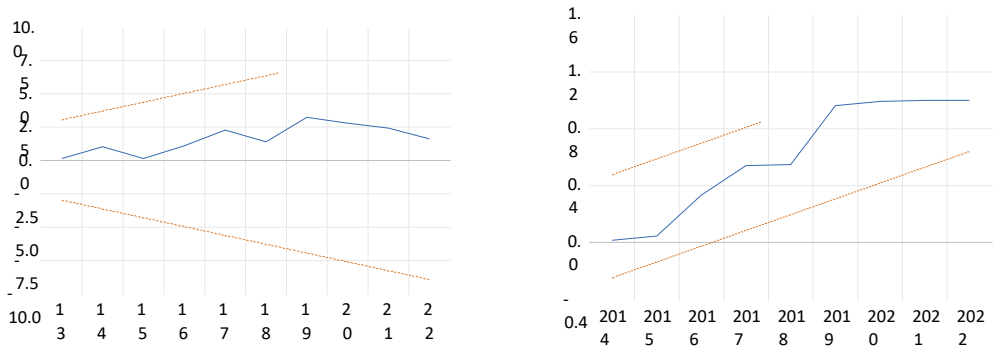
### 3.4.3 Stability test

The cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMQ) are conducted to found out whether the model parameters are stable or not. To be saying the data are stable, the blue line on the graph should be rested between two red lines.

The CUSUM and CUSUMQ results presented in Figures 3 and 4 suggest that the estimated model is stable. The study fails to reject the null hypothesis ( $H_0$ = the model is stable at all conventional level) of stable at all conventional levels of significance.



**Figure 3.** Stability test result using CUSUM and CUSUM Square



**Source:** Own computation using Eviews 12.

### 3.4.4 Auto-correlation Test

According to Brooks (2008), the disturbance terms is the covariance between the error terms over time is zero. In other words, it is assumed that the errors are uncorrelated with one another. To test this assumption the study Breusch-Godfrey Serial Correlation LM test was used to check the existence of autocorrelation.

The test reports the p-value of F-statistic and R-squared should be greater than 5% significance level ( $0.6472$  and  $0.3932 > \alpha=5\%$  or  $0.05$ ), respectively (Table 6). Both F-statistic and R-squared results were insignificant. The conclusion from both versions of the test in this case is that the null hypothesis ( $H_0=$  No Autocorrelation) of no autocorrelation is accepted.

**Table 6.** Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.224133	Prob.F(1,9)	0.6472
Observed R-squared	0.728958	Prob.chi-square(1)	0.3932

**Source:** Own computation using Eviews 12.

### 3.4.5 Heteroskedasticity Test

The assumption of homoscedasticity says that the variance of the error term is constant,  $\sigma^2$  this is known as the assumption of homoscedasticity. If the residuals of the regression have systematically changing variability over the sample, that is a sign of Heteroskedasticity. If the errors do not have constant variance they are said to be Heteroskedasticity (Brooks, 2008). This study used both Breusch-Pagan-Godfrey test and ARCH to test the existence of Heteroskedasticity.

The test result presented on table both F-statistics and Chi-square showed that there is no evidence that there is heteroskedasticity because the result in the P value is more than 0.05 (Table 7 and Table 8). In this case, the study fails to reject the null hypothesis of constant variance (homoscedasticity) and concluding that Heteroskedasticity is not present in the data.

**Table 7. Heteroskedasticity test by using Breusch-Pagan-Godfrey test**

F-statistic	0.516898	Prob.F(19,10)	0.8964
Observed R-squared	14.86458	Prob.chi-square(19)	0.7312
Scaled Explained SS	4.440755	Prob.chi-square(19)	0.9998

*Source: Own computation using Eviews 12.*

**Table 8. Heteroskedasticity test by ARCH**

F-statistic	0.002577	Prob.F(1,27)	0.9599
Observed R-squared	0.002768	Prob.chi-square(1)	0.9580

*Source: Own computation using Eviews 12.*

### 3.4.6 Multicollinearity test

In this study, to check the presence of Multicollinearity among independent variables, Variance inflation factors (VIF) was used. According to Hailer *et al.* (2006) Multicollinearity problem would be corrected when the Centered VIF value should be less than Uncentered VIF. In this study, all the values of Centered VIF are less than Uncentered VIF which fails to reject the null hypothesis (non-existence of Multicollinearity) and concluding that Multicollinearity problem is not present in between variables (Table 9).

**Table 9. Multi-collinearity Test result**

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LNPNV(-1)	0.016153	64.91669	4.072628
LNAIR	0.001259	25.04346	5.115140
LNAIR(-1)	0.001354	25.89801	5.203327
LNCREDIT	0.038161	1438.504	12.78896
LNDEBT	0.005478	40.21639	4.009336
LNDEBT (-1)	0.004720	34.08214	3.335928
LNEXPEN	0.022683	684.1720	4.522253
LNFDI	0.289950	1193.308	12.89588
LNPUINV	0.029792	441.3748	4.130845
LNREER	0.005612	124.5998	10.95244
LNREER (-1)	0.003619	76.76824	8.009063
LNIR	0.001918	26.46825	4.268918
LNIR(-1)	0.001946	26.82260	4.329172
LNOPEN	0.090955	7878.954	13.55189
LNUNEMP	0.009817	476.379	12.80310
C	6.468993	2348.92	NA

*Source: Own computation using Eviews 12.*

## 3.5 Results of the ARDL Short Run and Long-Run Dynamics

### 3.5.1 Short Run Dynamics (Error Correction Model Estimation)

Table 10 provides the outcomes of the short-run error correction terms. The Error Correction Model (ECM) is a non-spurious regression model as indicated by the R-squared and Durbin-Watson statistics. It leads the variables of the estimation to restore back to equilibrium or it repairs disequilibrium.

This happens when the sign of error correction (CointEq) is negative and significant. In this subsection, the short run Error Correction was estimated to balance in the long term and to clarify the speed of adjustment of any deviation towards in the long-run equilibrium. The error correction mechanism or cointegrating coefficient (CointEq) is negative (-1.050724) and highly significant considering the probability value (0.0000).

The negative sign of the coefficient of the error correction model indicates that short run shock was above the long run equilibrium value. The speed of the adjustment is captured by the magnitude of the error correction coefficient (1.050724). This implies about 10.5% only of the disequilibrium in private investment was restored in the short-run. This is a very slow speed of adjustment.

Furthermore; the value of the R<sup>2</sup> implies that about 97.95% (0.979517) of variations in domestic private investment are explained by the variations in the independent variables considered (Table 10). Therefore, the goodness of fit of the short run model is proved to be strong.

The short-run marginal impact indicates that all individual variables are statistically significant except external debt burden and foreign direct investment (Table 10). Explanatory variables such as inflation rate, public investment, real effective exchange rate and annual interest rate were found negative and significant effect on domestic private investment in short run (Table 10).

Unemployment rate was found positive and significant effect on domestic private investment while external debt service has positive effect but insignificant (Table 10). Foreign direct investment was insignificant and negative relationship with domestic private investment.

**Table 10. ARDL Error Correction Regression Result (short run)**

ARDL(1, 1, 0, 1, 0, 1, 1, 1, 0, 1, 0, 1)) selected based on Schwarz Criterion(SC)		Dependent Variable	D(LNPINV)	
Variable	Coefficient	Std.Error	t-statistics	P-value
CD(LNAIR)	-1.105145	0.013770	-7.635822	0.0000***
D(LNDEBT)	0.031556	0.030778	1.025279	0.3294
D(LNFDI)	-0.022478	0.035211	-0.638401	0.5376
D(LNPUINV)	-0.067095	0.013495	-4.971983	0.0006***
D(LNREER)	-1.536551	0.057138	-26.89214	0.0000***
D(LNRI)	-0.760203	0.074204	-10.24473	0.0000***
D(LNUNEMP)	0.221016	0.027538	8.025790	0.0000***

CointEq(-1)*	-1.050724	0.055830	-18.82003	0.0000***
R-squared	0.979517	Log likelihood	45.85138	
Adjusted R <sup>2</sup>	0.973000	Durbin-Watson stat	1.781907	
S.E. of regression	0.061284			

*Notes: \*\*\* denote statistical significance at 1% level.*

*Source: Own computation by using E-views 12.*

### 3.5.2 The Long Run Estimation Model

The technique involves first estimating the model using ARDL and testing the effect of variable in long run by using “long run form and bound test”. The results were stated in Table 11 below. The cointegration of variables indicates that the existence of long run among variables.

The long-run ARDL model was estimated based on the Schwarz Criterion (SC) using the maximum lag length of one. In long run, explanatory variables like inflation rate, external debt burden, public investment and real effective exchange rate were found negative and significant effect on domestic private investment (Table 11). Domestic credit to the private sector, foreign direct investment, real GDP and trade openness were found positive and significant effect on domestic private investment.

Total government expenditure and unemployment rate were insignificant and positive effect on domestic private investment while interest rate was insignificant and negative effect (Table 11).

**Table 11. Results of estimated long-run coefficients**

ARDL(1, 1, 0, 1, 0, 1, 1, 1, 0, 1, 0, 1) selected based on Schwarz Criterion(SC) = Level Equation			Dependent Variable: LNPINV	
Variable	Coefficient	Std.Error	t-statistics	P-value
LNAIR	-0.267475	0.069274	-3.861106	0.0032***
LNCRECREDIT	0.549756	0.210488	2.611812	0.0260**
LNDEBT	-0.444782	0.092737	-4.796160	0.0007***
LNEXPEN	0.552992	0.501136	1.103476	0.2957
LNFDI	0.372170	0.096899	3.840808	0.0033***
LNPUINV	-0.232112	0.056503	-4.107943	0.0021***
LNREER	-1.809484	0.260814	-6.937825	0.0000***
LNRGDP	0.134372	0.044257	3.036175	0.0125**
LNRI	-0.173539	0.319001	-0.544007	0.5984
LNTOPEN	0.369380	0.163210	2.263225	0.0471**
LNUNEMP	0.027954	0.076659	0.364655	0.7230
C	3.797920	2.310229	1.643958	0.1312

*Note: \*\*Significant at 5%; \*\*\*Significant at 10%*

*Source: Own computation by using E-views 12.*

$$\begin{aligned} EC = & \text{LNPIINV} - (-0.2675 * \text{LNAIR} + 0.5498 * \text{LNCREDIT} - 0.4448 * \text{LNDEBT} \\ & + 0.5530 * \text{LNEXPEN} + 0.37222 * \text{LNFDI} - 0.2321 * \text{LNPUINV} - 1.8095 * \text{LNREER} \\ & + 0.1344 * \text{LNRGDP} - 0.1735 * \text{LNRI} + 0.3694 * \text{LNTOPEN} + 0.0280 * \text{LNUNEMP} + \\ & 3.7979 \end{aligned}$$

### **3.6 Interpretation of Results and Discussion with Previous Findings**

#### ***3.6.1 Annual Inflation Rate and domestic Private investment***

In this study, Annual Inflation Rate (AIR) has a negative and highly significant effect at 1% level of significance on private investment in both short run and long run, which is in line with the prior expectation. This means keeping other things constant, a 1% increase in AIR results 1.10% (-1.105145) (Table 10) and 26.74% (-0.267475) (Table 11) decreases the development of domestic private investment in the short and long run, respectively.

High rates of inflation adversely affect private investment activity by increasing the riskiness of longer-term investment projects, reducing the average maturity of commercial loans, and misrepresenting the information conveyed by prices in the economy (Akpalu, 2002). In other way the existence of high inflation causes for the weakening of purchasing power of money, less space to save money in the bank and limits credit available for finance investment projects and affects private investment negatively.

Therefore, inflation causes low levels of domestic private investment since domestic investors predict a low return on capital. The current high inflation rate in Ethiopian seems to have affected domestic private investment in the short run by undercutting the saving capacity of citizens by generating diversion of investment from productive sector to speculative activities.

The finding was consistent with findings of Alamenew (2015) and Yirdaw et al. (2021) in Ethiopia and they found that inflation rate had a negative effect on private investment in both long run and short run. The same result was reported also in Malawi by Maluleke *et al.* (2022) and in Gambia by Ayeni (2020) they found out that, inflation rate had a strong negative effect on private investment.

However, findings were contradicted with Legass *et al.* (2022) and Waktola (2020) in Ethiopia; they found that inflation rate had a positive relationship with private investment. The consequence of their finding is that as prices of goods and services are rising higher in Ethiopia, a profit maximize individual sees it as an opportunity to make abnormal profits, thus venturing into such businesses in order to share in the perceived excessive gains.

The findings were also contradicted with Ajide and Bello (2013), and Damane (2015) conducted in other developing counties states that inflation affects significantly and positively the domestic private investment.

### **3.6.2 Public Investment and domestic Private investment**

As many scholars discussed in literatures, public investment and domestic private investment has both crowding-out and crowding-in effects. The effect of public investment in this result was negative and significant at 1% level of significance in both short run and long run which is similar with the prior expectation. Other things remaining the same, as public investment increases by 1%, domestic private investment declines by 6.71% (-0.067095) (Table 4.10) and 23.21% (-0.232112) (Table 11) in the short and long run, respectively.

The value of public investment indicate that it has ‘crowding out’ effect on the domestic private investment, as public and private sectors compete for the same resources in the economy. It is also means that there is a resource competition (finance and market) between public and domestic private investment.

Firstly, many developing countries are characterized by limited market size which indicates that public investment in productive sectors may displace private ventures, suggesting that public investment is a substitute for private investment.

Secondly, financial crowding out effect may occur if the increase in public investment is paid by borrowing on the domestic financial markets, which leads to greater incidence of limiting of credit to the private sector for there is limited credit pool in most developing countries (i.e., if the government is heavily borrowing from domestic financial institutions, this constrained private investment with regard to accessing loans from these institutions).

The same findings were reported in Ethiopia like Melaku (2020), Kibret (2018), Esubalew (2014), Ambachew (2010) and Shiferaw (2002) and in other developing countries like Ago (2020), Akçay and Karasoy (2020). Nevertheless, this finding is contradicting to the result that obtained by Ayeni (2020), Hailu (2013), Dash (2016), Adugna (2013), Mehabaw (2019), stated that, public investment can raise private investment in a situation where resources are not fully employed.

Public investment is acting as a crowding-in serve as a catalyst to private investment through external economies, like the provision of infrastructure such as transport (road access), communication and electric power.

### **3.6.3 Foreign Direct Investment and Domestic Private Investment**

Domestic private investment, usually owned by indigenous or local private investors while foreign direct investment and/or international portfolio investment is owned by a foreign company or project made from another country (Ndikumana and Verick, 2008). The effect of foreign direct investment in this study was negative and insignificant in short run which is opposing with the prior expectation. However, it was positive and significant at 1% level of significance in long run which is similar with the prior expectation.

This result indicate that if all other explanatory variables are held constant, as foreign direct investment increases by 1%, domestic private investment also increases by 37.22% (0.372170) in the long- run (Table 11).

The result was in line with Nguyen and Nguyen (2021), Mbaye (2014), Sisay (2010), Al-Sadig (2013) found that FDI stimulates private domestic investment which supports the crowd-in hypothesis, they found that the positive effects of FDI on private investment in low-income countries depends on the availability of human capital.

In Ethiopian, since 1992 market oriented economic reforms have been given to taken place and emphasis has been attracting FDI (Asante, 2000). Foreign aid boosts private investment if used to fund public expenditure on development. Aid therefore reduces taxation on private enterprises.

However, the result was contradicting with Mbaye (2014) stated that as foreigner invested foreign capital in low income countries, the domestic investor couldn't be competing in financial investment. FDI highly compete with labor force because it provides high salary and other benefits such as health assurance and allowance for his workers.

#### ***3.6.4 Domestic Credit to the Private Sector and Domestic Private Investment***

In this study, the effect of domestic credit to the private sector on domestic private investment was positive and significant at 5% level of significance in long run which is similar with the prior expectation. However, it is insignificant in short run. The result of long run indicates that, if the influence of another explanatory variable constant, as level of domestic credit to the private sector was increased by 1%, domestic private investment also increases by 54.98% (0.549756) (Table 11).

The implication of this is that as the availability of credit increases, people have access to finance for the required project and raises domestic private investment rates. The result was consistence with Aklilu (2021), Maluleke *et al.* (2022), Nwankwo and Allison (2021), stated that, domestic credit to the private sector and domestic private investment are significant and positively correlated in long run. The result was contradicting with Mbaye (2014), stated that, credit to private sector is surprisingly negatively related to private investments and significant in developing countries.

This shows funds to the private sector do not go to finance new investments. Due to rampant poverty, most people would borrow to finance for other matters like education, healthcare and basic necessities.

#### ***3.6.5 Real Effective Exchange Rate and Domestic Private Investment***

The effect of real effective exchange rate in this result was negative and significant at 1% level of significance in both short and long run which is similar with the prior

expectation. This result indicate that if all other explanatory variables are held constant, as exchange rate increases by 1%, domestic private investment declines by 1.54% (-1.536551) (Table 10) and 1.81% (-1.809484) (Table 11) in the short and long run, respectively.

As foreign currency (the value of dollar) increases, domestic private investment decreases. This implies that real devaluation of exchange rate affects private investment negatively through raising the real cost of imported goods. Ethiopia imports a large amount of good for investment; depreciation of the nation's currency leads to raise the price of these imported goods and creates adverse shocks on the supply of input items in the investment activities. The basic inputs of investment activities are founded appropriate mixture of machineries; equipment's used for construction purpose obtained from domestic and imported items.

The finding was similar with Gichamo (2012), Esbalew (2014) which states that exchange rate has negative relationship with domestic private investment. However, the result was contradicted with Frimpong and Marbuah (2010), Lesotlho (2006) which shows that real exchange rate appreciation in the time of higher export capacity and affects the rate of private investments positively. Having a weaker currency relative to the rest of the world can help boost exports.

### **3.6.6 Annual lending interest rate and Domestic Private Investment**

The annual lending interest rate is the rate of interest per year an investor expects to receive after investment. It is proximate by the bank rate. In this study, the effect of annual lending interest rate was negative and significant at 1% level of significance in both short and long run which is similar with the prior expectation.

This result indicate that if all other explanatory variables are held constant, as interest rate increases by 1%, domestic private investment declines by 76.02% (-0.760203) (Table 10) and 26.48% (-0.267475) (Table 11) in the short and long run, respectively. The result rejected the null hypothesis of there is positive relationship between interest rate and domestic private investment. It implies that a high level of real interest rates raises the real cost of capital and therefore diminishes the level of private investment and vice versa.

An increase in the real rate of interest will raise the user cost of capital, thereby making investment less profitable (Greene and Delano, 1991). This finding was consistent with the results of Akçay and Karasoy (2020), Mehabaw and Kerebih (2019), Balcilar *et al.* (2016), Afawubo and Mathey (2017), Kaputo, 2011) which revealed that interest rate has negative effect on private investment.

The finding was contradict with Legass *et al.* (2022), Atoyebi (2012), Agu (2015), Esubalew (2014) stated that the actual rate of interest is important and has a positive relationship with the rate of private investment. For the reason that, in rising interest rates there could be the existence of joint venture business.



### **3.6.7 Unemployment Rate and Domestic Private Investment**

In this study, the effect of unemployment rate was positive and significant at 1% level of significance in short run which is reverses with the prior hypothesis. However, it is insignificant and positive relation in long run. The result of short run indicates that, if the influence of another explanatory variable constant, as level of an unemployment rate was increased by 1%, domestic private investment also increases by 22.10% (0.221016) (Table 10).

This implies that, as unemployment rate increased the cost of input decreased because of working labor forces available cheaply (the investor paid cheap labor for production) that leads to increasing domestic private investment. Since Ethiopia has high unemployment rate especially youth it encouraging the growth of domestic private investment.

The result was similar with Ngoma *et al.* (2019), Waktole and Bogale (2018), Waktola (2020), stated that, unemployment rate has positive effect on private investment. However, the finding was contradict with Legass *et al.* (2022), Nguyen and Nguyen (2021), Michailat (2012), stated that, unemployment rate has negative effect on domestic private investment.

Because, high unemployment means that the economy is not working at maximum potential and is inefficient, resulting in lower productivity and incomes. An increase in social issues like crime and vandalism are more common in areas with high unemployment (especially in African countries). If crime and vandalism are practiced in one country the private investors are fear to invest their resource in that country.

### **3.6.8 External Debt Service and Domestic Private Investment**

To help low income countries like Sub Saharan African Countries particularly Ethiopia attain this goal, the IMF and the World Bank created the Debt Sustainability Framework in 2005 to periodically assess the situation and provide recommendations to address any potential risks (World Bank, 2005).

For economy of the debtor country to be sustainable, the World Bank recommended a maximum debt-service ratio of 10% for public debt. In this study, the external debt stock was positively affecting the domestic private investment and significant at 1% level of significance in long run which is equivalent with the prior expectation. However, it is insignificant in short run. The result of long run indicates that, if the influence of another explanatory variable constant, as level of external debt stock was increased by 1%, domestic private investment decreases by 44.48% (-0.444782) (Table 11).

This implies that external debt creates uncertainty in the macroeconomic environment and ‘crowding-out’ credits allocated for private investment where large debt service payment has involved and may face liquidity constraints in global

capital markets because of large sum of unpaid debt service obligations. As debt overhang explains large amount of debt eradicates the incentive for investors because returns from investors used for repay the existing debt and puts pressure on current and future tax burden on private investors (Ayeni, 2020; Esubalew, 2014).

Uncertainty of time and amount of external debt transfers to the creditors as it be subject to future levels of world interest rates, the purchasing capacity of exports and the ability to reschedule the existed debt also have big impact on private investors. The result was consistence with Ayeni (2020), Esubalew (2014), Kazeem *et al.* (2012), implies that external debt service has significant negative effect on private investment in long run.

Nevertheless, the finding was contradicts with Kibret (2018), Adugna (2013), Lawanson (2012), stated that, external debt service has significant positive effect on private investment. As long as it is used in productive investment it has favorable effect on the private investment in countries where there is serious shortage of finance.

### **3.6.9 Trade Openness and Domestic Private Investment**

Trade openness in Ethiopia is one policy, which the country adopts with the aim of expanding export, import and GDP of the country (World Bank, 2015). Trade openness in Ethiopia can be classified in to export promotion and import substitution. Ethiopian government eradicated restriction on exporter to promote the export and have trade surplus. In this study, the trade openness was positively affecting the domestic private investment and significant at 5% level of significance in long run which is equivalent with the prior hypothesis.

However, it is insignificant in short run. The result of long run indicates that, if the influence of another explanatory variable constant, as level of trade openness was increased by 1%, domestic private investment also increases by 36.94% (0.369380) (Table 11). This is Due to the fact that trade openness promotes technological progress, increases productivity and division of labor that can serve as a potential source of productivity, increasing in key markets, and rising competition of trade.

The result was consistence with the previous scholars (Mehabaw, 2019; Kibret, 2018, Ambe, 2017; Muhammedhussen, 2016; Sisay, 2010; Taddesse, 2011; Ajide and Bello, 2013; Adugna, 2013), who found a positive and significant effect between trade openness on private investment. However, the finding was contradicts with Ouattara (2004) pointed that the impact of the trade openness on private investment is negative. Because of private investment in Senegal is highly sensitive to external shocks.

### **3.6.10 Real GDP and Domestic Private Investment**

The growth and the level of the GDP provide an indication about the investment opportunities open to the economy. A broad measure of an economies size is its

output. This output is basically and mostly the results of private investment or capital accumulation. In this study, the real GDP was positively affecting the domestic private investment and significant at 5% level of significance in long run which is equivalent with the prior expectation.

However, real GDP is insignificant in short run. The result of long run indicates that, if the influence of another explanatory variable constant, as level of trade openness was increased by 1%, domestic private investment also increases by 13.44% (0.134372) (Table 11). The GDP shows an increase in sales and profits. The higher real GDP per capita is assumed increase effective demands for goods and services and thereby motivate private investors.

As income rises, capacity to manage resources to domestic saving rises and able to get more finance and begin new investment projects. Thus, it also creates consistent with expectations of neoclassical investment theory, positive association between private investment and income growth rate. Higher-income countries are more likely to put more of their money into domestic investments, which can then be used to help finance private investment (Mbaye, 2014).

The result was consistence with the previous empirical results from Ethiopia (Legass *et al.*, 2022; Ago, 2020; Mehabaw, 2019; Kibret, 2018; Ambe, 2017; Adugna, 2013; Basha and Debela, 2015), Ayeni (2020) from Gambia ,Ajide and Bello (2013) from Nigeria, Ngoma et al. (2019) evidence from Sub-Saharan Africa.

#### **4. Conclusion and Recommendation**

Private investment is one of the key factors that differentiate developed countries from developing countries. Higher investment leads to faster growth and job development, as well as more chances for the poor to improve their living conditions. The primary objective of the study was to investigate the effects and determinants of domestic private investment in Ethiopia by using a time series data from 1992-2022.

The findings of short run demonstrate that inflation rate, public investment, real effective exchange rate and annual interest rate were found negative and significant effect on domestic private investment. In short run, unemployment rate was found positive and significant effect on domestic private investment while external debt burden has positive effect but insignificant.

Foreign direct investment was insignificant and negative relationship with domestic private investment in short run. The results of long run shows that external debt service, inflation rate, public investment and real effective exchange rate were found negative and significant effect on domestic private investment. In long run, domestic credit to the private sector, foreign direct investment, real GDP and trade openness were found positive and significant effect on domestic private investment.

While total government expenditure and unemployment rate were insignificant and positive effect on domestic private investment while interest rate was insignificant and negative effect. The study recommended that since inflation has a negative relation with domestic private investment in short run and long run, policymakers should understand the cause for inflation volatility and keep in a stable manner.

Inflation should be kept at a manageable level because with the uncertainties that it brings, it hurts domestic private investment in Ethiopia. This study focused on the determinants of domestic private investments in Ethiopia for only 31 years (192 to 2022). The author suggests that for future research can expand the study period (more than 31 years) and include other macroeconomic, political and institutional variables.

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