Determinants of Private Investment In Ethiopia:
An Ardl Approach

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Abstract

One of the main engines of economic is private investment. As a result, the objective of this study was to investigate determinants of private investment in Ethiopia. The researcher employed a quantitative research approach with an explanatory research design to achieve the objective. study empirically tests whether Real GDP, inflation rate, real interest rate, foreign direct investment, tax rate, exchange rate, population growth rate, unemployment rate, international trade openness, education affect the growth of private investment in Ethiopia or not. The study focused based on 30 years of secondary data (i.e. from 1991 to 2020) on key variables. Multiple regressions using the ARDL model with appropriate software E-views 9 was applied. The ECM which indicates the speed of adjustment from short run towards long run. The main finding of the study indicated ln real GDP, population growth rate, rate interest, trade openness, and unemployment rate was statistically significant at 5% level of significance in the long run and short-run and also exchange rate was a positive and statistically significant effect on private investment in only short-run. Finally unemployment has adverse effect on private investment, the policy choice on the matter need a vigilant decision. Combined policy tools shall be used to achieve the great short run and long run targets.

1. Introduction

One of the challengeable issues for development-related discussion among policymakers, analysts, investors, researchers as well as various economic and financial institutions in developing and developed nations has been the role of the investment sector in the economic growth of nations. Besides, investment was defined by different scholars such as (Waktole & Bogale, 2018), (Seruvatu & Jayaraman, 2001), (Ndikumana & Verick, 2007),(Bakare, 2011), define investment to be an operation involving the purchase of items that will be used right away rather to consumed immediately. And others (Bakare, 2011) defined as an investment The act of acquiring income-generating assets, either as additions to existing assets or to replace assets that have depreciated. According to (Ouattara, 2004) investment has different meanings which means broad and open-ended, defined that the term 'investment' is essentially ambiguous means has broad meanings.

One of the key parameters that divide industrialized countries from a developing country is their degree of investment. From 1974-1991 Ethiopia economy was state-centered and state-controlled. After these 17 years, changes in the country enabled Ethiopia to start building a market-oriented economy. Different reforms have been implemented to achieve macroeconomic stabilization and growth Privatization of state-owned businesses and currency rate regulations were among the macroeconomic changes. (Taylor & Smith, 2007) In general, Ethiopia has continued to maintain a double-digit growth rate which averaged 10% over the last eight years. In the 2014/15 fiscal year, (GDP) growth was 10.2% compared to the 4.4% forecast for Sub-Saharan African countries.

Ethiopia was ranked among the best-performing African and developing Asian countries in the NBE annual report for 2014/15. In terms of economic sectors, agriculture contributed 24.5&, industry 29.4 and service 46.1 percentage points to the 10.2% real GDP growth in 2014/15. Due to Ethiopia's favorable investment climate, investment has gradually increased over the last seven years.

1.2. STATEMENT OF THE PROBLEM

Investment activity is a key force to a country's economic development. According to   (Bayraktar, 2003) Economic growth and development are largely dependent on a country's capacity to invest and use its resources efficiently and productively. In this regard, the private sector's contribution to the quantity of gross domestic product as well as its ability to properly allocate and use resources is critical. In a sense, growth is impossible without substantial and high-quality investment and effective use of resources. Economic growth is both a result and a cause of investment.

(Sesele, 2018), found that public investments, GDP growth, and public spending had a positive effect on the actions of private investors in South Africa. Similarly, (Kariuki, 2003), examining the factors of gross fixed capital formation in Kenya, the finding was governmental investment has a favorable impact on private investment. (Abhijeet & Dinesh, 2010) found that the experience of investment is highly determining both the investor behavior and investment decision, the study concludes that an increase in the experience will be helpful

to the investor.

Even though multiple studies on the causes of private investment have been undertaken using various variables and in various locations. Furthermore, multiple empirical research on the determinants of private investment has been conducted this increasing the quality and advantages of investigations the determinants of the private investment sector. However, studying private investment is a necessary thing because the effect of variables on private investment may be changed throughout time due to the nature of the variables has short and long-run effects on private investment sectors.

According to the researcher's knowledge, no empirical evidence has been conducted on the following variables, such as Unemployment rate, Exchange rate uncertainty, Trade liberalization, Education enrolment, and population growth rate. Based on this case the researcher forwarded this study and the researcher aimed to investigate the main causes of private investments and reach the appropriate results by test the inconsistent nature of the identified independent variables studied by the previous researcher.

2.   Literature Review
2.1.Empirical Review
There have been empirical studies by researchers to determine factors affecting investment behavior and volume of investment in Ethiopia and outside the country. The main determinants of investment in a given country can be at a micro and macro level. However, the study emphasizes the macroeconomic factor of private investment.

(Asante, 2000) examined at the elements that influence private investment in Ghana. by combining a time-series analysis with a cross-sectional analysis, Although some of the individual effects of macroeconomic instability components have been determined to be insignificant, the overall macroeconomic instability measure has been a severe impediment to private investment. The expansion of real credit to the private sector boosted private investment in a statistically meaningful way.

(Serven & Solimano, 1993), and (Greene & Villanueva, 1991) all stated that private investment is positively linked to a country's real GDP growth. is that economic growth (RGDP) is one of the most widely used indicators for analyzing the impact of private investment. This is because 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. Empirical findings from Nigeria's. (Ajide & Lawanson, 2012) Senegal's (Ouattara, 2004) and (Asante, 2000) have shown that a higher real GDP growth rate encourages domestic private investment. (Ghura & Goodwin, 2000) In Asia and Latin America, real GDP growth has a stimulant effect on private investment, but this effect is insignificant in Sub-Saharan Africa.

(Ali & Shaheen, 2016) During the period 1980 to 2011,(ECM) was used to explore the economic factors that affect private investment in Pakistan. Savings, credit, and gross domestic product are positive factors of domestic private investment in Pakistan, while inflation and external debt stock are negative determinants of domestic private investment, according to the empirical findings.

3. DATA AND METHODOLOGY
3.1. RESEARCH DESIGN
Research designs are plans and procedures for research that spans the decision from broad assumptions to detailed methods of data collections (Creswell, 2014). Explanatory research design helps to identify and evaluate the causal relationships between the different variables that pertain to the research problem. Accordingly, the study employed explanatory research design to identify the major factors that affect private investment. And

3.2. MODEL   SPECIFICATION
The model was stated as

PRI =F (INF,IR, TXR, EXR ,RUEP ,FDI ,GDP ,EDU, POP and TROP,)

Where **PRI** is dependent variable represents private investment and from an independent variable, **INF** is the rate of inflation, **IR** is the rate of interest rate**, TXR** is the tax rate, **EXR** is the exchange rate, **UEP**, is the unemployment rate**, FDI** foreign direct investment, **GDP** is a gross domestic product, **EDU** is educational enrollment, **TROP** is trade openness, pop population growth rate.

The standard model expressed as

$$prit = b_0 + b_1 inf_{1t} + b_2 inr_{2t} + b_3 txr_{3t} + b_4 unr_{4t} + b_5 exr_{5t} + b_6 gdp_{6t} + b_7 edu_{7t} + b_8 tro_{8t} + b_9 fdi_{9t} + b_{10} popro_{10t} + u_t$$ ---eq(1)

inf **is** inflation, **inr** is interest rate , **txr** tax rate, **exr** exchange rate, **unr** unemployment rate ,**gdp** gross domestic product, **fdi** is foreign direct investment, **edu** is education, **tro** is trade openness ,and   **bi** is the parameters of all independent variable **ui** is random error.

3.2.1 MODEL ASSUMPTION TEST
Autoregressive distributed lag model test

$$y_t = \Upsilon_{0i} + \sum_{i=1}^{p} \delta i\, y_{t-i} + \sum_{i=0}^{q} \beta_i x_{t-i} + E_{it} \text{------------------------------------eq(8)}$$

Where y is the vector or the dependent variable and the variable in (xit) are allowed to be purely I(0)or I(1)or co-integrated; $\beta_i\; and\; \delta i\; are$ coefficients Υ is constant; i=1,2,,,n and p:q is optimal lag orders; Eit is a vector of the error term "p" lag for dependent variable "q" represents the lag order for the independent variable. So when we apply the variables into the equation the function becomes in the form of:

$$\Delta lnpri_t = \beta_0 + \sum_{i=1}^{P}\beta_{1i}\Delta lngpri_{t-1-i} + \sum_{i=1}^{q}\beta_{2i}\Delta inf_{t-i} + \sum_{i=1}^{q}\beta_{3i}\Delta txr_{t-i} +$$
$$\sum_{i=1}^{P}\beta_{4i}\Delta lngdp_{t-i} + \sum_{i=1}^{P}\beta_{5i}\Delta exr_{t-i} + \sum_{i=1}^{P}\beta_{6i}\Delta inr_{t-i} + \sum_{i=1}^{P}\beta_{7i}\Delta edu_{t-i} +$$
$$\sum_{i=1}^{P}\beta_{8i}\Delta tro_{t-i} + \sum_{i=1}^{P}\beta_{9i}\Delta lnfdi_{t-i} + \sum_{i=1}^{P}\beta_{10i}\Delta pop_{t-i} + \sum_{i=1}^{P}\beta_{10i}\Delta uner_{t-i} +$$
$$U_t \quad - eq(9)$$

3.7.3.4. Vector Error correction model (VECM)
The error correction model would be used to investigate the model's short-run relationships. The speed of adjustment towards the long-run equilibrium is explained by the error correction component included in the model. The ECM approach corrects the equilibrium error in one period by correcting the equilibrium error in the next period.

Hence, it can be reformulated in terms of differences and lagged levels. In addition, to separate the short-run and long-run multipliers of the model, so add vector error correction model (VECM). Therefore, the error correction version of the ARDL model is.

$$\Delta lnpri_t = \beta_o + \sum_{i=1}^{P}\beta_0\Delta lnpri_{t-1-i} + \sum_{i=0}^{P}\beta_1\Delta inf_{t-i} + \sum_{i=0}^{P}\beta_2\Delta inr_{t-i} + \sum_{i=0}^{P}\beta_3\Delta txr_{t-i} +$$
$$\sum_{i=0}^{P}\beta_4\Delta unr_{t-i} + \sum_{i=0}^{P}\beta_5\Delta exr_{t-i} + \sum_{i=0}^{P}\beta_6\Delta lngdp_{t-i} + \sum_{i=0}^{P}\beta_7\Delta edu_{t-i} + \sum_{i=0}^{P}\beta_8\Delta tro_{t-i}$$
$$\sum_{i=0}^{P}\beta_9\Delta lnfdi_{t-i} + \sum_{i=1}^{P}\beta_{10i}\Delta pop_{t-i} + \theta_0 lngpri_{t-1-i} + \theta_1 inf_{t-1} + \theta_2 inr_{t-1} + \theta_3 txr_{t-1} +$$
$$\theta_4 unr_{t-1} + \theta_5 exr_{t-1} + \theta_6 lngdp_{t-1} + \theta_7 edu_{t-1} +$$
$$\theta_8 tro_{t-1} + \theta_9 fdi_{t-1} + \theta_{10} pop_{t-i} + \lambda ECM_{t-1} + U_t \text{-}$$

✓ λ =(1- $\sum_{i=1}^{P}\delta_i$), speed of adjustment parameter with negative sign and significant at 5%. 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.

✓ Θ = $\sum_{i=0}^{q}\beta_i \big/ \beta_o$ is long-run parameter. Δ denotes the first difference operator; α_0 is the intercept of the model, β's are coefficients of short-run dynamics, θ's are long-run relationship, p is the optimal lag length and U_t is the usual white noise residuals.

4. RESULT AND DISCUSSION
4.1. Descriptive analysis
This chapter presents the findings and discussion of the study in achieving the objectives aimed to address based on the methodology discussed in the previous chapter. The study used time series data covering from 1991 to 2020 which is 30 years of data. The chapter has two main parts. The first part is devoted to the trend of the variables to achieve the objective of the study and making descriptive analyses about the variables of interest and their relationships.

4.1. The growth of domestic private investment in Ethiopia from 1991/2 to 2019/20.
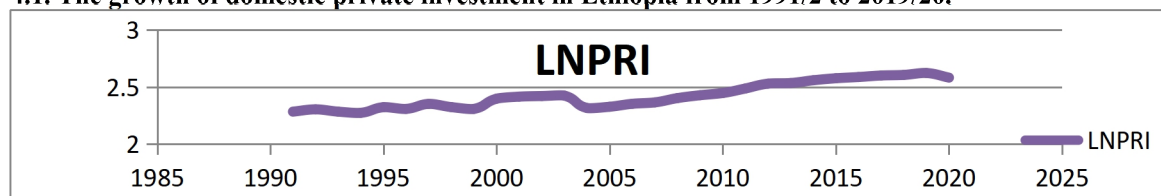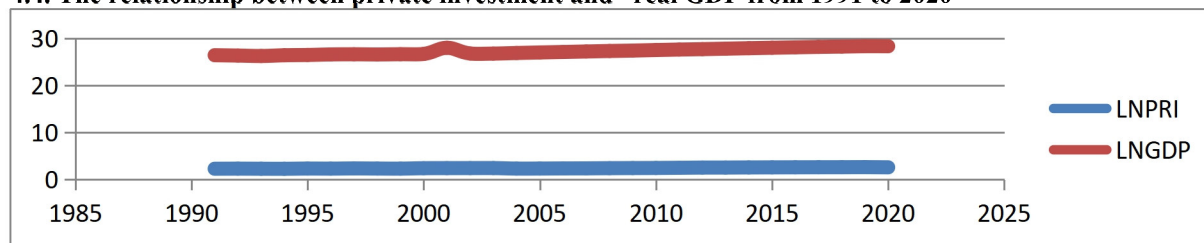

(Source: own computation NBE, IMF/2021)
Figure 4.1 shows the trend of private investment in Ethiopia between 1991 to 2020

As shown in the figure there are upward and downward movements of the growth rate of real investment in Ethiopia from 1991 -2020. As result, the growth rate of investment from 1991 to 1992 was increased by 0.87 percent. However, in the years 1992-1993 the growth rate of private investment -1.3 percent the growth rate was negative. This showed, there were two major phenomena's happened which lead to the reduction of the growth

rate of private investment in Ethiopia during this period. The first was the transition period in Ethiopia. The Second was the 1991 war between the Durg regime and EPRDF (Ethiopian People Revolutionary Front) this indicated that private investment low.

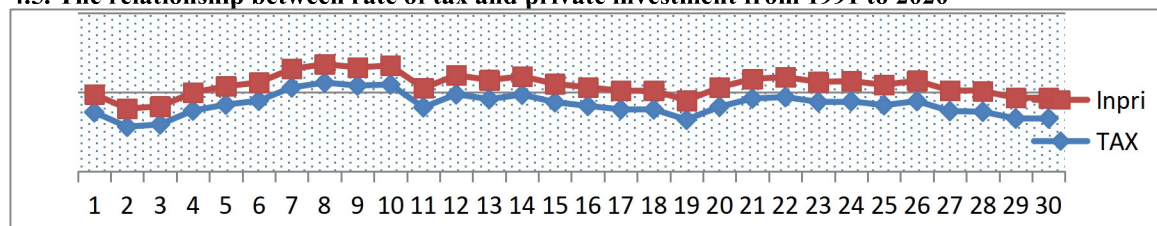## 4.4. The relationship between private investment and real GDP from 1991 to 2020

(Source: own computation WB/2021)
Figure 4.2 the growth of real GDP in Ethiopia from 1991-2020.
Note: the number from 1 up to 30 indicated the number of the year from 1991 to 2020

As shown in the above figure private investment is one component of the growth of the economy. This indicated that when the growth of GDP increased private investment also increased. Increasing GDP people have enough funds this induced private investment. The above figure indicated an upward trend for the study period. 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

4.5. The relationship between rate of tax and private investment from 1991 to 2020

(Source: own computation WB/2021)
Figure 4.5 the relationship between rate of tax and private investment from 1991 to 2020
Note: the number from 1 up to 30 indicated the number of the year from 1991 to 2020

The above trend indicated the relationship between the rate of tax and the growth of a private investment. Thus tax has a positive relation to the economic growth of the nation or the real gross domestic product. Because governmental expenditure is one component of GDP. So increasing tax revenue for the government leads to increasing government expenditure these results raise gross domestic product. Increasing gross domestic product encouraged to increase in private investment in Ethiopia.

4.4. Preliminary Analysis
4.4.1. Stationary Test
The primary task in an econometric work is 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). Moreover according to (Pesaran, Shin, & J. Smith, 2001) in applying the ARDL model all the variables entered in the regression should be integrated in order and first difference.

H0: the series has unit root (non-stationary) &H1: no unit root (stationary)

Table 4.3 Augmented Dickey-Fuller test

Variables	T calculated	P value	Order of integration
LNPRI	-5.212	0.0002*	I(1)
LNGDP	-5.26	0.0001*	I(0)
LNFDI	-4.418	0.0016*	I(0)
Interest rate	-3.92	0.0284**	I(0)
Inflation	-4.39	0.0017*	I(0)
Education	-4.279	0.0024*	I(1)
Population	-5.076	0.0000*	I(0)
Exchange Rate	-3.08	0.0400**	I(1)
Tax rate	-6.151	0.0000*	I(1)
Trade opennes,	-6.242	0.0001*	I(1)
Unemployment	-6.172	0.0000*	I(1)

(Source: Own computation by using e-views 9 2021)

Note: **- 0**, shows the integrated variable at level, **D** shows the variable at first difference
*, shows variable is stationary at a 1% .**, shows variable stationery 5%.

Thus, from table 4 it could be decided that none of the variables integrated into I(2). And some variable is stationary at the level and some variable was stationary at first deference, Desire in applying the ARDL model. So ARDL cointegration method proposed by (Pesaran et al., 2001) is the most suitable method for valuation this type of integration.

4.4.3. Model stability and diagnostic test

4.4.3.1. Normality test, (ut~ N (0, σ2)

Even if there are numerous tests for normality assumption, like the histogram of residuals, normal probability plot (NPP), the most common one is Jarque-Bera (1981) test. If the residuals are normally distributed, the histogram should be bell-shaped and Jarque-Bera p-value statistics could not be significant.
. The hypothesis of the normality test was formulated as follows:

H0: the data are normally distributed
H1: The data are not normally distributed

As the Jarque-Bera statistics have a P-value of 0.634560 implies that it is greater than 0.05, which indicates there is no evidence for the presence of abnormality in the data. Thus, the null hypothesis that the data is normally distributed should fail to reject since the P-values were over 0.05 significant levels. It could be concluded that there is no problem with normality.
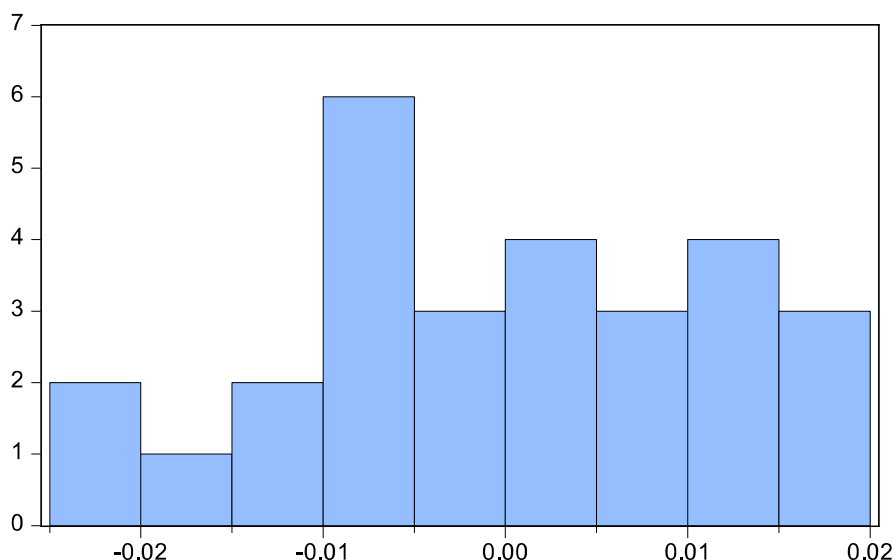
Series: Residuals	
Sample 3 30	
Observations 28	
Mean	7.93e-16
Median	-0.000414
Maximum	0.018077
Minimum	-0.022809
Std. Dev.	0.011083
Skewness	-0.188063
Kurtosis	2.201109
Jarque-Bera	0.909647
Probability	0.634560

(Source: own computation by E-views 9)
Figure4.9; Normality test

4.4.3.2. Autocorrelation test to test (cov (ui,uj)=0 for every i,j)

The other test would the test of absence of autocorrelation (cov(ui,uj)=0for every i,j) in the model, assumption states that the covariance between the error terms over time is zero. According to Brook (2014) "it was assumed that the errors uncorrelated with one another. If the error is correlated with one another, it would be stated that

they are auto-correlated or they are serially   H0: No serial autocorrelation (cov (ui,uj)=0for every i,j)
 H1: Autocorrelation   (cov (ui,uj) $\neq$ 0   for every i,j)
Table **4.5** Test of autocorrelation under breush-godfrey serial correlation lagrigne multiplier test

B. Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.782037	Prob. F(2,8)	0.4828
Obs*R-sq	16.87128	Prob. Chi-Square(3)	0.0973
$\alpha = 0.05$			

(Source: own computation by E-views 9)

Based on the above Q statistics the probability values greater than the standard significant value (0.05) as well as Breusch-Godfrey Serial Correlation LM Test, this is another test for Autocorrelation in residuals. The Brush-Godfrey test was used because the Durbin Watson test is not reliable when lagged values are used in the model. LM test of autocorrelation the probability value of f statistics was 0.4828 greater than the level of significance (0.05) then the null hypothesis field to reject in both tests Concluded that there is no serial autocorrelation or the error term is not correlated one another.

4.4.3.3. Homoscedasticity Test   (var(ut)= σ2)

the researcher uses to arch and brush- pagan Godfrey tests. the hypothesis of the study:
 H0 : Homoscedasticity which (var(ut)= **σ2**)
  H1:heteroscedasticity which   (var(ut)=$\boldsymbol{\sigma_i^2}$)

Heteroskedasticity	**Test:**	**Breusch-Pagan-Godfrey**	
F-statistic	0.84	ProbF(17,10)	0.6351
Obs*R-sq	16.5044	Prob. Chi(17)	0.4884
Scaled expSS	1.264267	Prob.chi(17)	1.0000

Source: own computation by E-views 9

Based on the above two tests (ARCH and Breusch-Pagan-Godfrey**)** there is no evidence for the existence of the error term is not constant. The standard significant value (0.05) but the p-value of statistics 0.6351 and the p-value of statistics of (arch) 0.8166 which is above 0.05 .since p-value above the significant value, then the null hypothesis of (var(ut)= **σ2**) is filed to reject.

4.4.3.4 MULTI-COLLINEARITY ASSUMPTION

H0: No multicollinearity

H1: multicollinearity

Table **4.8 Test** of multicollinearity

Variance Inflation Factors			
	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
LNPRI(-1)	0.058083	10559.77	22.36867
LNGDP	0.000720	16613.55	10.03283
LNFDIOL	2.43E-05	254.0199	2.679851
LAGEDU	1.341890	1.884504	1.662257
INTSRATE	5.50E-06	15.66420	4.120782
INF	4.98E-07	3.284453	1.682958
EXCHAR	0.122504	86.38648	22.11269
POPGR	0.408165	14.21620	1.541954
TROPN	0.027614	39.11987	16.93479
UNE	0.008682	2.147439	1.387208
TAX	3.69E-05	84.50845	2.276154
Mean of vif			7.89

Based on this the centered variance inflation factor (VIF) of each independent variable was less than 10. So the null hypothesis was accepted. Therefore there is less multicollinearity among on independent variable since the mean of the centered variance inflation factor was lower than the rule of thumb.

4.4.3.5. Model stability

H0: The parameter is not stable

H1: The parameter is stable
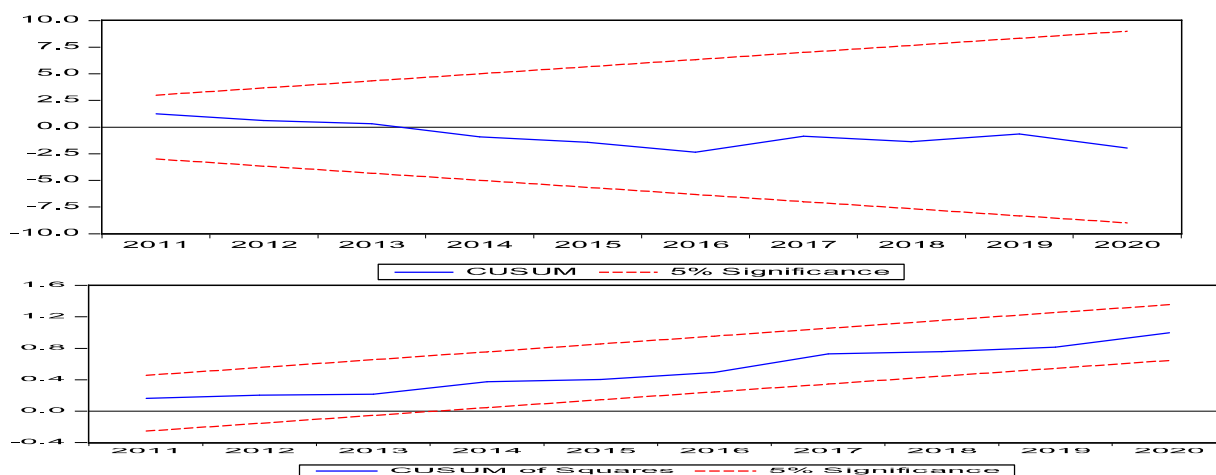
Source: Own computation by using e-views 9 (2021)

4.10 plot of cusum and cusums tests

Above figure reflects the plot of CUSUM and CUSUMS tests did not cross the critical limits or feasible boundary. So, it could be concluded that long-run estimates are stable and there is no structural break. Hence the results of the estimated model are reliable and efficient.

4.4.3.7. Bounds test for cointegration

Table 4.9.1 Bounce test of cointegration

   H0: No long-run relationship but H1: Long run relationship

ARDL Bound Test
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	4.484171	10

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	1.83	2.94
5%	2.06	3.24
2.5%	2.28	3.5
1%	2.54	3.86

As indicated in the following table, the value F-statistics 4.484171 is more than the lower and upper bound of standard significant values but the researcher is concentrated on 5% of the level of significance this also satisfied. Based on this the null hypothesis of no co-integration could be rejected. Therefore, accept the alternative hypothesis means that there is co-integration among variables in the long run.

4.5. Long-run model estimation ARDL Model

After determining the order of integration and proving the existence of co-integration among the variables, the estimated long-run relationship between the variable was estimated. Therefore, the long-run parameters were determined by applying the ARDL long-run model. And the estimated coefficient could be reported in the table below.

Table 4.9.3 estimated long-run coefficients using the autoregressive distributed lag model:
ARDL Cointegrating And Long Run
Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POPGR	1.404047	0.381511	3.680230	0.0042*
LNGDP	0.138213	0.027121	5.096264	0.0005*
LNFDI	0.002231	0.003501	0.637204	0.5383
LAGEDU	-0.855739	1.288603	-0.664083	0.5217
INTSRATE	0.007291	0.002676	2.724896	0.0214*
INF	0.000224	0.000476	0.470788	0.6479
TAX	0.020434	0.005054	4.043137	0.0023*
TROPN	0.616482	0.169418	3.638810	0.0045*
UNE	-0.133262	0.054282	-2.455013	0.0340*
EXCHAR	-0.501706	0.267537	-1.875280	0.0902
C	-1.705575	0.727982	-2.342881	0.0411*

(Source: won result using E-views 9/2021)
Note: * significant at 5% level of significant

4.5.1. Results of long-run ARDL model
The result of table 14 shows that the long-run ARDL model. The model indicated that there was a long-run relationship between variable (private investment) with others

Real gross domestic product (GDP)
Table 14 shows that the gross domestic product would have a positive relationship with private investment. The positive relationship was consistent with the economic theories. From the result of the regression, GDP has a long-run relationship with private investment. When the real GDP increased by 1 unit, private investment increase by 0.138213 units in long run. The justification is Economic growth (RGDP) is one of the most widely used indicators for analyzing the impact of private investment. This is because 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. this study confirms to (Serven & Solimano, 1993), and (Greene & Villanueva, 1991) all stated that a country's real GDP growth is positively linked to private investment.

Interest rate
The modern theory (classical theory) said that when an increasing rate of interest would be increasing the people to save and leads domestic credit raises finally increasing investment activity. In the same fashion, this study revealed a positive and significant relationship between interest rate and gross private investment at a 5% level of significance. The result indicated that when the rate of interest increased/ decreased by 1 percent the private investment would be increased/ decreased by 0.729% in long run. (Oshikoya, 1994) looked at how interest rate deregulation influenced private investment in Kenya. The private investment ratio was the dependent variable, with the following explanatory variables: real economic growth rate, real deposit rate of interest, adjustments in terms of exchange, public investment ratio, inflation rate, and lagged debt service ratio as explanatory variables. The findings revealed that the actual rate of interest is important and has a positive relationship with the rate of private investment. The finding showed that Interest rate, real GDP were the key positive long-run determinants of domestic private investment.

Therefore the result of this study also supports the modern theory and those finding indicated that interest rate might have a positive effect on private investment. Because in raising interest rates there could be the existence of joint venture business

Rate of Tax
On the other hand, the government would impose a high tax rate to protect and strengthen the growth of infant industries by protecting them from foreign competition. A higher rate of tax on an imported good that might be a high tariff on imported goods there would increase the motivation of private domestic investors to produce those goods domestically without reducing the price then the private investment would expand. Based on this reason rate of tax would have a long-run positive and significant relationship with the growth of private investments.
The study also stated that the growth of gross private investment and tax rate have a positive relationship at a 5% level of significance. This means when the rate of tax imposed by the government increased by 1% private investment also increased by 2.043 percent in long run. This study is confirmed with Adugna (2013), Haroon, and Naser (2011) conducted a study on the determinants of private investment in Ethiopia using the ECM model.

Trade openness
Theoretically, trade liberalization has a positive impact on private investment because it increases exports, which in turn increases investments, and increased imports of inputs to production increases efficiency and competitiveness. From the result of the regression, trade liberalization increased by one percent private investment increased by 0.616 percent. According to (Ajide & Lawanson, 2012) real GDP, real interest rate,

credit to the private sector, terms of trade, and reforms dummy all have a positive effect on private investment in Nigeria.

Unemployment rate

Unemployment means "people don't have a job" the international labor organization stated that unemployed if he or she is without work. Which means she or he was not in paid employment or self-employment during the particular reference period. The unemployment rate reveals the economy's spare ability and underutilized capital. Unemployment is cyclical decreases when increasing the economic growth as businesses hires more jobs to meet rising demand. When the economy slows, unemployment normally rises. High unemployment means that the economy is not working at maximum potential and is inefficient, resulting in lower productivity and incomes. Unemployed people are therefore unable to buy as many items, resulting in lower spending and productivity. Unemployment increases may have a negative multiplier impact. An increase in social issues, Crime and vandalism are more common in areas with high unemployment (especially among youth The regression result of this study's unemployment rate p-value was 0.0340 which is less than 0.05 percent).this indicated that when the level of the unemployment rate was increased by 1 percent the gross domestic private investment would be decreased by 0.1332 or13.32% in long run.

According to Aaronson, (Michaillat, 2012) investigates the factors that have contributed to the rise in long-term unemployment, as well as the implications for potential economic growth, and (Michaillat, 2012) They work on a similar subject, focusing on the economic and health implications, such as wages, disability benefits, and mortality also (Michaillat, 2012) is interested in the role of matching frictions in influencing and thus explaining unemployment; he proposes a search-and-matching model; Their finding indicated that inflation and unemployment rate increasing the cost of input leads to reducing the GDP causes the downsizing of private investment.

Population growth rate

The population growth rate was one of the explanatory variables that measured private investment. As the result of this population growth would have a long-run and short rune effect on the growth of investment in   Ethiopia.

In this study, the effect of the population was significant because the p-value (0.0042) less than the standardized 0.05 significant value. This indicated that population growth could have a significant effect on the growth of private investment, the β value (coefficient) indicated positive this implies population growth was a positive impact on investment growth. This means the growth rate of the population increased by one percent(1%) leads to private investment would be increased by 1.4% in long run. also when the growth rate decreased by 1% private investment decreased by 1.4% if the influence of another explanatory variable constant in long run.

Population growth is beneficial to economies. First Economic benefits such as tax base expansion and increased customer spending at local businesses are among them, other benefits resulting from cultural innovations aimed at keeping up with rising populations. Second, the effect of population growth on the makeup of overall market demand is critical for investment opportunities (Sweezy, 1940). This study agrees with previous studies because population growth has a positive significance in long run.

4.6. Short-run error correction model (VECM)

After the acceptance of the long-run coefficients of the growth equation, the short-run ECM model would be estimated. The error correction term (ECM) indicates the speed of adjustment to restore equilibrium in the dynamic model. Moreover, it should have a negative sign and statistically significant at a standard significant level (i.e. p-value should be less than 0.05).

Table 4.9.4 Short run test of co-integration

Short-run Co-integrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob *.
D(POPGR)	1.553754	0.523807	2.966273	0.0141*
D(LNGDP)	0.071188	0.031471	2.262015	0.0472*
D(LNFDIOL)	0.002469	0.003859	0.639754	0.5367
D(LAGEDU)	0.399688	0.912540	0.437995	0.6707
D(INTSRATE)	0.003979	0.001680	2.368149	0.0394*
D(INF)	0.000248	0.000506	0.490500	0.6344
D(TAX)	0.010327	0.008153	1.266713	0.2340
D(TROPN)	0.330462	0.137690	2.400049	0.0373*
D(UNE)	-0.147471	0.057596	-2.560423	0.0284*
D(EXCHAR)	2.582638	0.599549	4.307637	0.0015*
CointEq(-1)	-1.106625	0.180248	-6.139451	0.0001*

(Source: own computation E-views 9)

4.6.1 Output interpretation in the short run (VECM) Model

Real GDP

real gross domestic product has a significant and positive effect on private investment both short run and long run(Bosco & Emerence, 2016). Know the short-run effect of GDP in this result was positive and significant.at 5% level of significance. This means a one percent increase in GDP results in private investment increased by 7.1% in the short run. This indicated that increasing of real GDP private investment also increased.

Real interest rate

The real interest rate one of the explanatory variables used to measure private investment. The result indicated that it also a positive impact on private investment in the short run. This means that when the real interest rate increases by one percent, private investment increased by 0.3 percent. This study supports the finding of (Frimpong & Marbuah, 2010) .Private investment, in the long run, is positively related to real output, inflation, real interest rate, openness, and real exchange rate; while negatively affected by external debt. (Lesotlho, 2006) discovered that GDP growth, private sector credit, real interest rates, and real exchange rates all have a positive impact on investment. According to the study the actual rate of interest is significant and has a positive relationship with the rate of private investment.

International trade openness

One of the explanatory variables used in the analysis to assess external openness and the effects of trade liberalization on private sector investment was international tread openness. Therefore trade openness would have a positive impact on private investment accordingly the result of this study indicated that trade openness increased private investment also increased. When international trade liberalization increased by 1 percent private investment increased by 0.33 percent in the short run. According to (Ajide & Lawanson, 2012) real GDP, real interest rate, credit to the private sector, terms of trade, and reforms dummy all have a positive effect on private investment in Nigeria, according to. According to (Asante, 2000), a restrictive trade regime harm private investment, while trade liberalization has a positive impact. Furthermore, (Lesotlho, 2006) discovered that GDP growth, private sector credit, real interest rates, and real exchange rates all have a positive impact on investment.

Exchange rate

The exchange rate has a significant and positive effect on private investment in the short run. The result shows that a 1 percent increase in foreign currency, private domestic investment increased by 2.56 percent in the short run. Because when the birr value or the local currency depreciation relative to foreign currency, this result money issues. The first one is there would be the price of imported goods rise and the consumer price index that measured inflation also rises. The consumption of the domestic product should be increased due to the devaluation of the domestic currency relative to dollar value.

According to (Lesotlho, 2006) Having a weaker currency relative to the rest of the world can help boost exports, real exchange rates all have a positive impact on investment. According to (Frimpong & Marbuah, 2010) found that real GDP, public spending, private sector credit, inflation, real interest rate, real exchange rate, and constitutional law have a positive impact on private investment in Ghana in the long and short run. Accordingly this result indicated that the output was in line with the above researchers.

Rate of the unemployment rate

The unemployment rate was one of explanatory variable that used for measure private investment. The result of the study indicated that unemployment rate would cause short-run and long-run growth of private investments in particular economic growth in general. The result indicated that the unemployment rate affects the growth of private investment negatively. This means that with the one percent increase of unemployment rate the private domestic investment decreased by 0.15 percent in the short run.

Population growth rate

Population growth is the weapon of the country's growth. Because without population there would not growth of the economy. This indicated that the working labor forces and innovative persons would generate from the population. Based on this reason the population growth rate would be a significant and positive relationship to private investments. This implies one percent increase in the growth rate of the population leads 1.55 percent increased the private investments in the short run. Or when the growth rate of the population decreased by 1% the growth of private investment increased by 1.55 % in the short run.

Vector error correction coefficient

The error correction model is given as $\Delta y = \alpha_0 + \alpha_1 \Delta x + \alpha_2 u_{t-1} + \epsilon$ where, $\alpha 2$ is the error correction (adjustment) coefficient and $\alpha 1$ is the short-run coefficient. The parameter $\alpha 2$ is the error-correcting speed of the adjustment term. If $\alpha 2 = 0$, then there would be no evidence for the long-run relationship. The ECM estimated coefficient is -1.0166 and statistically significant at a 5% significant level. And it has the correct sign. To have long-run equilibrium required 102% adjustment in the short run. The coefficient of ECM shows that short-run deviations of private investment are corrected/ adjusted to long-run equilibrium very fast at a rate

of 102% each year. And the number of year takes 30.39 year. The negative sign shows that the short-run private investment shifting aspects is below the long-run equilibrium level.

5. CONCLUSION AND RECOMMENDATION

Private investment is one of the major contributors to economic growth in both industrialized and developing nations. 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 objective of this study aimed to investigate determinants of private sector investment in Ethiopia.

This study investigated the effect of gross domestic product, foreign direct investment, population growth rate, educational enrollment rate, real interest rate, inflation, exchange rate, tax rate, unemployment rate, trade openness, on the private investment in Ethiopia. The ARDL model is suited for this investigation since the variable is integrated at order or first difference, or both. The co-integration test result of Johansen determines whether or not the variables have a long-term relationship. The findings demonstrate that GDP, population growth rate, unemployment rate, trade openness, tax rate, and real interest rate all have long-run and short run effect on private investment in Ethiopia, whereas exchange rates have a short-run determinants on private investment.

5.2. RECOMMENDATION

The following points are suggested based on the regression results and the overall analysis. Because of this recommendation necessary policy implications.

This study sought out to empirically identify the primary determinants of private investment in Ethiopia throughout the period 1991-2020, based on appropriate theoretical foundations and empirical research done for most industrialized nations. By using modern time series econometric techniques such as the ARDL model, the bounce test of cointegration, the Johansen cointegration test, stationary, and stability tests, this finding provide crucial information for policy formulation, implementation, and evaluation aimed at increasing private sector investment in Ethiopia.

The study forwarded to the Ethiopian government's or policy's side. Even though most of the variables in this study had a favorable impact on the increase of private sector investment in Ethiopia, But private investment would be influenced by more micro and macroeconomics variables. So the government of Ethiopia should adopt the exit strategy by reversing from small growth to the rapid growth of the private investment in Ethiopia. Through managing macroeconomics variables that have a negative influence on private investment in Ethiopia example unemployment rate.

The first strategy related to reducing of unemployment rate was use of labor intensive technology. If sufficient employment opportunities are to be developed in both the urban and rural sectors of the economy, both the organized and unorganized sectors must adopt labor-intensive technology. The finding show's that growth in real production (GDP), population growth, international trade, interest rate, and tax rate are all drivers of private sector investment growth in Ethiopia. The significant positive impact of trade openness or trade liberalization on private investment in the short and long run indicates that the government plays an important complementary role in boosting private sector initiatives. And the second strategy the government should ensure political stability, enhancing educational standards or education and training. (Phetsavong & Ichihashi, 2012)And take a strategic plan to capitalize variables that would have a positive influence on private investments in the short-run and long run. And the second strategy the government should ensure political stability, enhancing educational standards or education and training. And take a strategic plan to capitalize variables that would have a positive influence on private investments in the short-run and long run.

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