An Econometric Study on Determinant of Investment in Rwanda: An empirical analysis 1990- 2020

Gasana Eric[1,*], Habimana Jean Paul [1,2]

[1] *Department of Economics, University of Kigali, P.O BOX 2611, Kigali-Rwanda*

ABSTRACT
This paper assesses the determination of investment in Rwanda period of 1990-2020 considering variables like income, foreign Aid, Exchange rate and Trade openness.Long- and short-term dependencies between variables can be calculated with the use of Johansen Cointegration test and an autoregressive distributed lag regression model. The results of the study affirm the existence of a dynamic adjustment in the short run and an equilibrium link between these macroeconomic factors in the long run as they relate to investment in a country. The findings of this study using EViews showed both long-run and short-run effect of the gross domestic product on investment and even the impact of foreign aid on private investment is proved in this study especially in predefined cointegration long-run model. Finally, a negative impact of exchange rate and trade openness rate on gross fixed capital formation is evident based on the empirical results in this study. Therefore, the empirical evidence provided suggests that there would be an increase in the level of private investment when the country increases the level of its total output. This study concluded that both monetary policy and fiscal policy could be effective through the direct determination of appropriate policies to control the movement of these effects.

I. INTRODUCTION
Investment is a crucial aspect in determining economic growth in both developed and developing nations. Rwanda requires large investments in the promotion and expansion of economic activities that would result in improved living conditions for the Rwandan people.In development economics, the debate on the investment – growth nexus still ongoing in order fordeveloping countries to cash up with the developed economies. The theory of investment has remained to be one of the unsettled issues in economics. Economists have tried to formulate different theories to explain the concept of investment basing on experiences from mainly developed countries.Investment in fixed assets like buildings, machinery, and stockpiles is given special consideration in capitalist economies.Therefore, investment in terms of physical capital whether from government, non-profit institution and households is directly linked to the economic growth (He, 2006); (Charles, 2012).

Gross fixed capital formation also called Investment refers to produced fixed assets, less disposals plus the value additions of existing assets realized in an economy for a given period of time. Fixed assets are the ones that are produced to be reused in production of other goods and should last more than 1 year in production process. Fixed assets may include buildings, machinery, transport equipment, or intellectual property such as software or the results of research and development (Eurostat, 2013).

On Rwandan context Investment both public and private is a key to sustainable development, in 2019, Rwanda's high rate of public investment will amount to 13% of the country's GDP. From 2015 to 2018, Rwanda's public sector capital expenditures as a percentage of GDP were almost double the average for Sub-Saharan Africa and significantly higher than in most East African countries. When compared to GDP, Rwanda's public investment spending is third highest in the world (behind only Timor-Leste and Afghanistan). The government's strategy to make Rwanda a top destination for MICE (meetings, incentives, conventions, and exhibitions) required substantial public investment. As measured by the Global Competitiveness Index (GCI), both the quality and availability of infrastructure services improved by 2019. However, there is a wide range of performance among peers depending on the industry. A score of 52 indicates relatively high-

quality infrastructure, in comparison to the average of 45 for all of Sub-Saharan Africa (SSA) ((Report, NST1, 2017-2024).

In 1994, Rwanda had a per-capita GDP of $146. As reported by the IMF, it stood at $774 in 2017 and climbed to around $830 by year's end 2018. Long-term, Rwanda aspires to join the ranks of the Middle-Income Countries (MICs) by 2035 and the High-Income Countries (HICs) by 2050. Multiple National Strategies for Transformation, each covering a period of seven years, will be implemented to realize this goal (NST1).The NST1 came after the implementation of two, five-year Economic Development and Poverty Reduction Strategies EDPRS-1 (2008-12) and EDPRS-2 (2013-18), under which Rwanda experienced robust economic and social performances. (workbank, 2020)

Rwanda also recognizes the role of domestic investment or gross fixed capital formation towards economic growth. Both policy and Institutional framework achievements and the establishment of Rwanda Development Board (RDB) which is in charge of attracting private investments from both domestic and foreign (GFCF) sources; the establishment of the national investment policy (2017), Rwanda Private Sector Development Strategy (2013-18) as well as the Country Framework Report (CFR,2005), prepared by the government of Rwanda with the support of the World Bank and the Public-Private Infrastructure Advisory Facility (PPIAF),all of which designed to stimulate both public and private investment through capital formation.

All effort put together for economic thriving as matter of fact(MININFRAReport, 2019)contribute to some factors affecting investment growth like electricity access increased to 51(MW)%51% in 2019 from 46.7% (46.7 MW) in 2018. In the transport sector, notable achievements were realized in the areas of roads rehabilitation, upgrading, maintenance and air transport. The number of passengers transported by Rwanda-Air increased considerably hitting, for the first time, a seven-digit figure per annum (1,151,300 passengers). In the Water and Sanitation sector, more efforts were concentrated on achieving universal access to clean water whereby water production capacity increased from 237,120m 3 by end June 2018 to 267,660m3 /day by June 2019 and water network was extended with new 820.1Km to serve 405,295 people.

However, according to (Mutamuliza, 2016), due to the insufficient capital formation, Rwanda has not yet completed the infrastructural revolution necessary for its development. Despite efforts by both government and private sector organizations to address the issue, providing residents with access to adequate and affordable infrastructure remains one of the most significant obstacles to local economic development. The main obstacles to achieving sustainable economic development of the country and bolstering investment remain issues of availability of roads, energy (lack of access to electricity), clean water and sanitation, housing, and communication network.

The primary objective of this research was to examine the long- and short-term results of macroeconomic factors on investment in Rwanda from 1990 to 2020. Investment in Rwanda is influenced by a number of factors, and understanding these influences helps shape better economic policy. Based on a partial analysis, the study found support for the hypothesis that GDP, real exchange rate, foreign aid, and trade openness all influence Gross fixed capital formation in Rwanda.

II.   LITERATURE REVIEW
1.1.   Accelerator Theory
The accelerator effects states that there is a strong relationship between the level of Investment and the rate of change in GDP. Thus, an increase in the rate of economic growth will positively cause an increase in the level of investment same as a fall in the rate of economic growth will cause a fall in investment level(Clark, 1917)
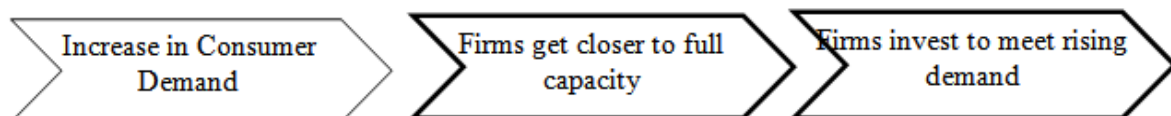
Thus, the accelerator effect happens when an increase in national income (GDP) results in a proportionately larger rise in capital investment spending. In other words, we often see a surge in capital spending by businesses when an economy is growing quite strongly. As the factor affecting the national Income are the government expenditures, consumption, exports, imports this shows also that the interest rate, trade openness and external debt

will indirectly contribute in either positive or negative level of investment in the country

1.2. Neoclassical Theory

The traditional neoclassical model of aggregate investment is based on marginalist principles and predicts that the level of investment will fall as interest rates rise. There are two derivations of this relation. When calculating the optimal capital stock level, also known as the "demand for capital," factor prices play a pivotal role. Second, the optimal capital stock is a positive function of investment.

In short, the optimal aggregate capital stock K^* as a function of the real interest rate:

$K^*_t = f(r_t)$ with $f' < 0$

Thus;

$I_t = g(K_t^x(r_t), K_t) = f(r_t)$ with $g'(K^*) > 0$ and $f' < 0$,

In summary, the firms continue to increase investment until the marginal product of capital equals the cost of capital(Jorgenson, 1963). Further, aligning some of the variables within the neoclassical view" Credit to private" in neoclassical concept considering the money flow in the economy in view of money as in fact a medium of credit that condition indicates that the way money enters circulation influences production, distribution and prices. Public spending for goods and services effectively allocates to certain hands a transactional medium that offers unique benefits cash services to individuals. "External debt" (Elemendorf, 1999) and (Mankiw, 1999) based on the neoclassical model stressed out that public debt might affect economic out in both positive and negative way which also touch level of Investment.

1.3. Tobin's Q Theory of Investment

The theory of Tobin Q-ratio is built on comparison of two elements: The market value of firm's capital stock and the replacement cost of the existing capital stock. The market value of firm capital stock is that stock from which investors get paid annual dividends and capital gains once the prices of stock rise up. On other hand, replacement cost refers to that cost incurred by firm while replacing or acquiring new capital stock. (Tobin, 1969) analyzed this context and stated that the market value of physical capital of a firm exceeded its replacement cost, then capital has more value "in the firm" (the numerator) than outside the firm (the denominator)

**Tobin writes its q-ratio as under:**

$$Q = \frac{Market\ Value\ of\ Firm\text{'}s\ Capital\ Stock}{Replacement\ Cost\ of\ the\ Capital\ Stock}$$

Hence, the theory posits that referring to the Q-ratio, firms will continue to acquire new capital stock as long as the q-ration is higher than one, that is, when the market value of firm's capital stock is higher than the replacement cost. However, if q-ration is less than one that is when the market value of firm's capital stock is less than the replacement cost of capital stock, firm's mangers will be discouraged to continue increasing the capital stock and hence investment will obviously reduce.

In summary, firm's investment decisions will depend on the value of Q-ratio, whether its value is greater or less than one. Once the ratio is higher than one, investment will increase while once the ratio is less than one investment will decrease accordingly(Skjeggedal, 2012).

1.4. Conceptual framework

According to Colander (2003), a conceptual framework is an analytical tool with several variations and contexts. It is used to make conceptual distinctions and organize ideas. A conceptual framework contributes to a research report in at least two ways: it identifies research variables and clarifies relationships among variables. Figure 1 presents the schematic presentation of independent variable as investment determinants and dependent variable as investment.The concept framework is built on the hypotheses that change in investment is due to each one of the stated variables namely Gross domestic product, Trade openness, Credit to private, Real exchange rate, Gross saving, Interest rate and External debt.
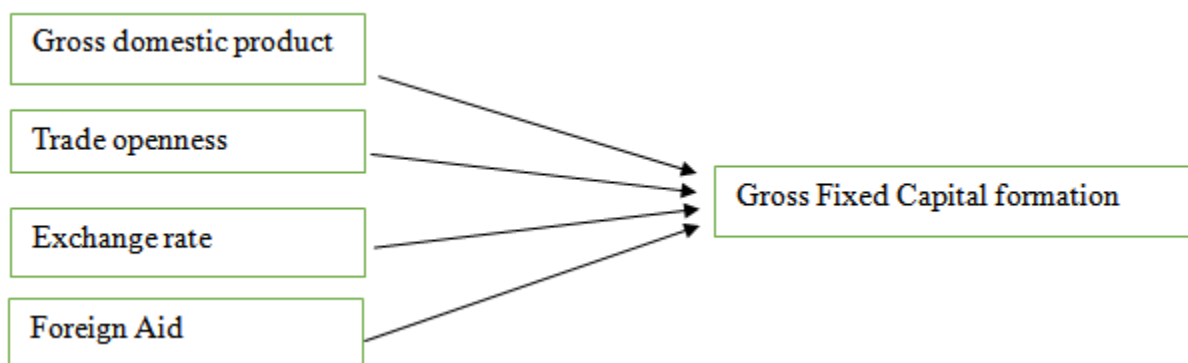
III.   RESEARCH METHODOLOGY

This study used a time series data to investigate the dynamic effect between investment, trade openness, exchange rate, foreign aid and the Output or income in long run and in short run for the case of Rwanda

Methods of evaluation was based on the economic criteria, statistical criteria (test) see Gujarati,) (Dawn, 2009) and econometric approaches are applied: signs of parameters in the model, the coefficient of determination (R^2) see, (Gujarati, 2006), unit Root tests "ADF test was used, cointegration, VECM and other different diagnostic tests such as stability test, Normality test, Serial correlation tests and Heteroskedasticity test

Our Econometrics model will be:

$$Y_{it} = \beta_0 + \beta_1 GDP_t + B_6 FA_t + \beta_2\ TOP_t + \beta_4 EX_t + \mu D_i + \varepsilon_t$$

It is worth to transform the data into logarithms in order to interpret the results in terms of percentage. In logarithmic form the model becomes:

$$Y_{it} = \beta_0 + \beta_1 logGDP_t + B_6 logFA_t + \beta_2 logTOP_t + \beta_4 logEX_t + \mu logD_i + \mu_t$$

IV.   PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

Test for Stationarity

Variables	ADF	Model Specification	T-statistics	Order of Integration
LGFCF	Level	Intercept	-3.277035	I (1)
		Trend and intercept	-4.296729	
	1st Difference	Intercept	-6.929085	
LGDP	Level	Intercept	-3.559938	I (1)
		Trend and intercept	-4.296729	
	1st Difference	Intercept	-6.614458	
LForeign_Aid	Level	Intercept	-2.427221	I (1)
		Trend and intercept	-4.296729	
	1st Difference	Intercept	-5.366445	
LTOP	Level	Intercept	-4.354443	I (0)

Source: EViews 12

Stationarity test is checked to test for any no sense regression or spurious regressionfrom the above table, all the variables (the gross fixed capital formation, gross domestic product, exchange rate and foreign aid are stationary at their first difference. Their ADF test values (in absolute value) are greater than the critical value and their probability (P-value) are less than the critical value at 1 %, 5%, and 10% percent confidence level hence, we have to reject the null hypothesis that the

foreign direct investment, gross domestic product and exchange rate are have a unit root/ or are not stationary.

Unrestricted Cointegration Rank Test (Trace)				
No. of CE(s); Ho	Eigenvalue	Trace-Eigen Statistic	5% Critical value	Prob**
None*	0.872388	159.4874	95.75366	0.0000
At most 1*	0.765037	99.78321	69.81889	0.0000
At most 2	0.653073	57.78177	47.85613	0.0045
At most 3	0.483045	27.08121	29.79707	0.0997
At most 4	0.215447	7.947027	15.49471	0.4711
At most 5	0.030907	0.910432	3.841465	0.3400

Source: EViews 12

- Trace test indicates 3 cointegrating eqn (s) at the 0.05 level
- Denotes rejection of the hypothesis at the 0.05 level
- **Mackinnon- haug-Michelis (1999) p-values

Using the Johansen cointegration test the results shows that both trace statistics and maximum Eigen value test revealed three cointegrating equations at 5% level of significance. The null hypothesis of no cointegration among the variables was rejected at none, and at most 1 since the P-value is less than 5% in all of these tests.

Cointegration Equation for the Long run

```
Dependent Variable: LGCFC
Method: ARDL
Date: 10/10/22   Time: 11:11
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): LGDP LFA LEX LTOP DV
Fixed regressors: C
Number of models evaluated: 32
Selected Model: ARDL(1, 1, 0, 0, 0, 1)
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LGCFC(-1)	0.307752	0.228986	1.343981	0.1933
LGDP	1.544101	0.103060	14.98257	0.0000
LGDP(-1)	-0.566459	0.298986	-1.894599	0.0720
LFA	0.059904	0.061235	0.978261	0.3391
LEX	-0.106561	0.073611	-1.447637	0.1625
LTOP	0.006349	0.122757	0.051723	0.9592
DV	-0.020501	0.062210	-0.329539	0.7450
DV(-1)	0.079660	0.050861	1.566224	0.1322
C	-8.108576	2.263850	-3.581763	0.0018

R-squared	0.996512	Mean dependent var		20.24980
Adjusted R-squared	0.995183	S.D. dependent var		1.022457
S.E. of regression	0.070966	Akaike info criterion		-2.209909
Sum squared resid	0.105759	Schwarz criterion		-1.789550
Log likelihood	42.14863	Hannan-Quinn criter.		-2.075432
F-statistic	749.8609	Durbin-Watson stat		2.285895
Prob(F-statistic)	0.000000			

Source: EViews 12

$$LGFCF=-8.10857+1.5441LGDP+0.0599LFA-0.106LEX+0.00634LTOP-0.020501DV$$

Estimates of the variables in levels from the co-integration regression reveal the long run effects of the regressors. Three variables show positive coefficients while exchange rate shows a negative coefficient. Positive coefficients show a positive long run relationship while negative coefficients show a negative long run relationship. Also, all the variables are not significant at 5 percent level of significance, except for GDP (P-value of 0.0000). However, the insignificant variables will not be dropped at this stage since our interest here was to obtain the residuals from the co-integration regression. The residuals obtained from the co-integration regression results above, will be used in the next sub-section to establish if the co-integration model is valid. Which is lined with the accelerator theory stated that any increase in national income (GDP) will increase proportionately the level of investment (Harrold, 1936)

From Table 4.4, the results for the estimated of long run model shows that the R-squared is 0.9965 hence only GDP is statistically significant meaning that it has long-run effect on investment in terms of the gross fixed capital formation (Rwanda: data from 1990-2020). Its probability is less than 5% the level of significance. This means that in the long run, the variations in the Gross fixed capital formation are underpinned for 99.6% by real GDP. On the other hand, other variables (Foreign aid, exchange rate and trade openness), have either a positive or negative long run relation but are not statistically significant.

ARDL Regression Models (Short run)

ARDL Error Correction Regression
Dependent Variable: D(LGFCF)
Selected Model: ARDL(2, 0, 2, 2, 2, 2)
Case 3: Unrestricted Constant and No Trend
Date: 10/31/22   Time: 21:13
Sample: 1990 2020
Included observations: 29

ECM Regression
Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.82925	0.731519	-18.90483	0.0000
D(LGFCF(-1))	0.380606	0.066904	5.688818	0.0001
D(LFA)	0.072827	0.041386	1.759706	0.1020
D(LFA(-1))	-0.121894	0.034554	-3.527611	0.0037
D(LEX)	0.796966	0.155478	5.125908	0.0002
D(LEX(-1))	0.160445	0.091874	1.746359	0.1043
D(LTOP)	0.249465	0.100194	2.489804	0.0271
D(LTOP(-1))	0.352236	0.082391	4.275166	0.0009
D(DV)	-0.029153	0.030037	-0.970551	0.3495
D(DV(-1))	-0.055378	0.025863	-2.141231	0.0518
CointEq(-1)*	-1.162565	0.061007	-19.05624	0.0000

R-squared	0.991493	Mean dependent var	0.077823
Adjusted R-squared	0.986766	S.D. dependent var	0.351198
S.E. of regression	0.040401	Akaike info criterion	-3.298215
Sum squared resid	0.029381	Schwarz criterion	-2.779586
Log likelihood	58.82412	Hannan-Quinn criter.	-3.135787
F-statistic	209.7784	Durbin-Watson stat	2.154483
Prob(F-statistic)	0.000000		

* p-value incompatible with t-Bounds distribution.

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	43.71133	10%	2.26	3.35
k	5	5%	2.62	3.79
		2.5%	2.96	4.18
		1%	3.41	4.68

Source: EViews 12

The cointegration Equation is significant with the negative sign as expected and the negative shows that there is a strong and an effective conversion process towards long-run equilibrium comparing in the face of short run that are just meant for shocks. In the short run most are significant at the first difference except the exchange rate that is really significant at level which shows the short run effect of the variables mentioned determining investment.

4.5.1. Auto-correlation test

The assumption of this test is as follows Null hypothesis (Ho)=No serial correlation at up to 2 lags, alternative Hypothesis(H1) = There is a serial correlation at up to lag 2 and we will base on the F-statistics or even the P-value of our findings.

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	2.066231	Prob. F(2,23)	0.1495
Obs*R-squared	4.721514	Prob. Chi-Square(2)	0.0943

Source: EViews 12

Because the prob chi square (2) is greater than 5% level of significance so we fail to reject the null hypothesis that bring us in concluding that there is no serial correlation in our model.

4.5.2. Heteroskedastic

Heteroskedasticity Test: ARCH

|			
F-statistic	0.098774	Prob. F(2,26)	0.9063
Obs*R-squared	0.218681	Prob. Chi-Square(2)	0.8964

Test Equation:
Source: EViews 12

Because the prob chi square (2) is greater than 5% level of significance so we fail to reject the null hypothesis we can say that there is no ARCH effect.

4.5.3. Normality test

The assumptions of this test are as follow Ho: (null hypothesis) the residuals are normally distributed. H1: the residual is not normally distributed. The null hypothesis is rejected when the probability is less than 5%.
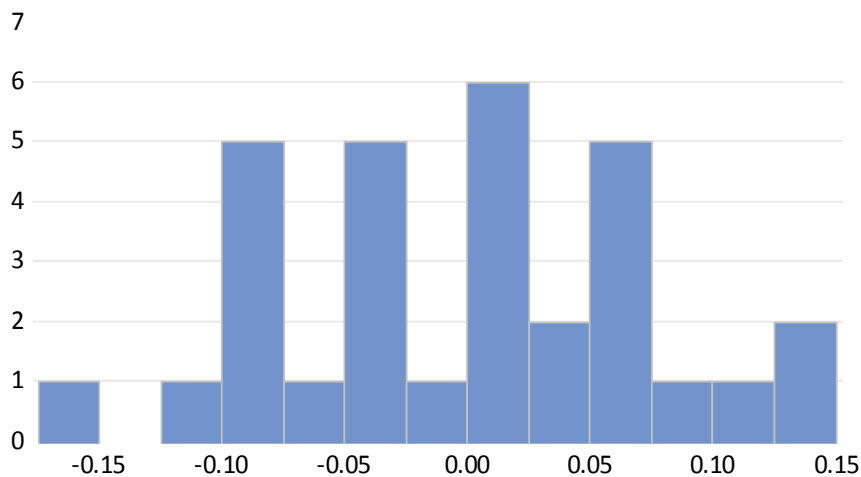
| Series: Residuals	
Sample 1990 2020	
Observations 31	
Mean	1.08e-15
Median	0.006631
Maximum	0.149274
Minimum	-0.172495
Std. Dev.	0.076070
Skewness	-0.069012
Kurtosis	2.541200
Jarque-Bera	0.296500
Probability	0.862216

Source: EViews 12
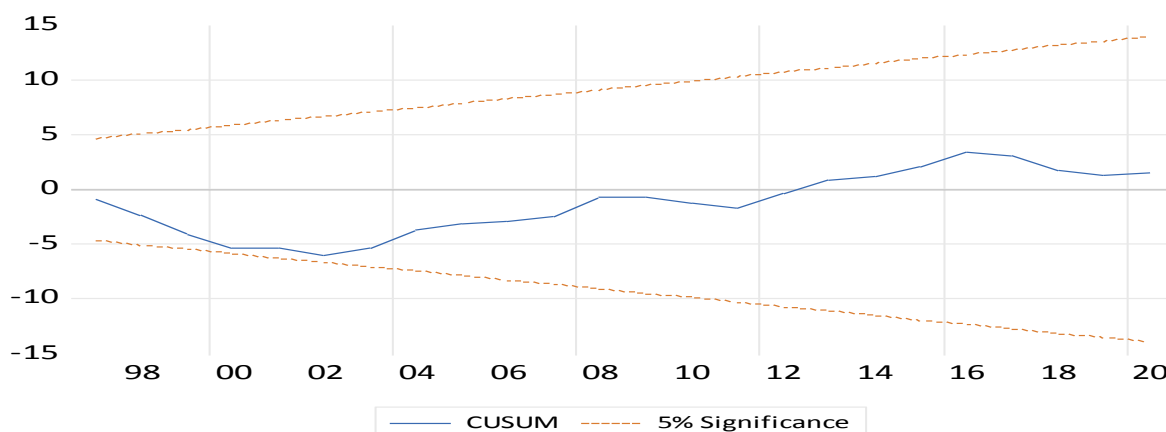
Source: EViews 12

As it can be seen from the figure, above the CUSUM ploys doesn't cross the 5% critical lines, therefore, we can safely conclude that the estimated parameters for the short-run dynamics and long-run of the Investment function in Rwanda are stable thus the results are appropriate for policy implications.

4.5.4. VAR-Stability Test

The stability of VAR model is checked looking the on the position of the Roots of in the circle whether it is positioned inside the circle or if the roots of cross around for our model the roots of is positioned inside the circle enable us to conclude that our model is stable.

Inverse Roots of AR Characteristic Polynomial
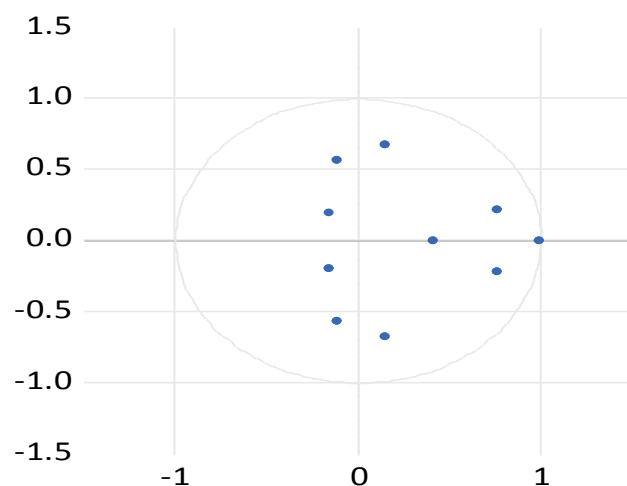
Source: EViews 12

V.   CONCLUSION

As the multivariate Johansen cointegration test and Gregory-Hansen cointegration test demonstrated, the included variables maintain a stable long-run relationship despite the presence of an endogenously determined structural break, allowing for the estimation of non-spurious EC models. An ARDL model that balances the variables' short- and long-term characteristics was developed using the Engle-Granger method(Granger C. , 1969). The EC model is reasonably good at explaining the data and following the trends within the sample. Long-term growth in GFCF is positively correlated with growth in real GDP, but is negatively correlated with changes in inflation and real interest rates. Lagged increases in real GDP have a positive and statistically significant effect on GFCF inflows, while the exchange rate has a negative effect when lags are greater than one period. Similarly, to the long-term findings, the short-term effects of the lag in the real interest rate on GFCF inflows are positive and statistically significant. Both the D (real interest rate) and D (inflation) equations have

a negative and statistically significant EC term, indicating that imbalances in the current year tend to be corrected in the following year.

1.5.   Recommendation

High levels of nominal gross domestic product (NGDP) are necessary for economic growth and in attracting investors in a small, open economy like Rwanda. In recent times, Rwanda has seen a fruitful discussion of different models for monetary policy. This study's findings, especially those from the multiple regression models, make it abundantly clear that the transmission mechanism of monetary policy is crucial to the growth and development of the Rwandan economy. Following are some suggestions for improving Rwanda's monetary policy and stimulating the country's economy, bearing in mind the arguments and data presented above.

1.6.   Policy Implications

Investment is the most important macroeconomic variables that can affect or be affected by the economic growth.

An attempt has been made to check the relationship between Investment and GDP of Rwanda and the result shown positive relation between Investment and GDP. This shown the importance of Investment in the country.

Government of Rwanda should spend most of its budget on productive projects that lead to economic growth (GDP) further, the special emphasis also must be given to sustainable economic infrastructures development which is major pulling factor for investors. Foreign aids also should be allocated for productive projects that can generate revenue for the country and boost the economy.

The government should be engaged in promotion of macro-economic stability by increasing public investment or helping the investors being a shareholder in needed projects then phase its investment out to invest in other major projects. This will lead the country to the wealth creation to reduce aid dependency.

Finally, also on the financial sector, The Rwandan financial system should be made more effective in its monetary management by making all financial markets organized so as to accentuate the effects of monetary policy variables like real Interest rate and nominal exchange rate. This promotes nominal GDP in Rwanda which is the one of the main factors to attract the investors.

By concluding, despite the findings of this study further research need to be conducted in this area of investment as the outcome of this research

is limited on some determinants of investment including the gross domestic product, the foreign aid, Exchange rate and Trade openness thus there are many variables determine investment such as saving, remittances, interest rate and others not forgetting that there are few readings specifically on this domain of private investment.

REFERENCES

[1].   Abbes etal. (2015). Causal interactions between GFCF, and economic growth: evidence from dynamic panel co-integration. Procedia Economics and Finance, 2015. 23 : p. 276-290.

[2].   Agbloyor etal. (2016). Foreign direct investment and economic growth in SSA: The role of institutions. Thunderbird International Business Review, 58, 479–497. doi:10.1002/tie.21791.

[3].   Anderson. (1990). " Investment and Economic Growth", world development ,vol. 18,pp.1057-1079.

[4].   Azman-Saini etal. (2010). GFCF and economic growth: New evidence on the role of financial markets. Economics letters, 2010. 107 (2): p. 211-213.

[5].   Baldwin. (2003). Openness and growth: what is the empirical relationship?

[6].   Baloyi & Bekker. (2011). Causes of construction cost and time overruns: The2010 FIFA World Cup stadia in SouthAfrica. Acta Structilia , 18 (1), 51-67.

[7].   Belloumi. (2014). The relationship between trade, GFCF and economic growth in Tunisia: An application of the autoregressive distributed lag model. Economic systems, 2014. 38 (2): p. 269-287.

[8].   Beugelsdijk etal. (2008). The impact of horizontal and vertical GFCF on host's country economic growth. International Business Review 17 (4): p. 452-472.

[9].   Chakraborty & Nunnenkamp. (2008). Economic reforms, GFCF, and economic growth in India: a sector level analysis. World development, 36 (7): p. 1192-1212.

[10].   Daniel & Kaseem . (2019). A Causality Analysis Of The Relationships Between Gross Fixed Capital Formation, Economic Growth And Employment In South Afria,Studia universitatis Babes-Bolyai Oeconomica volume 64,Issue1,2019 Pp.33-44 Doi:10.278/Subboec-2019-0003.

[11]. Egbulonu & Adaku. (2018). Trade Openness And Nigeria's Economic Growth (1990- 2015)

[12]. Eurostat. (2013). European System of national and regional accounts 2010, European Union, 2013.

[13]. Fontaine etal. (2006). The Stakeholder Theory of MNC. Available at: http://www.edalys.fr/documents/Stakeholders%20theory.pdf. (Accessed: 7th December, 2020).

[14]. Ghazanchyan & Stotsky . (2013). Drivers of growth: Evidence from sub-SaharanAfrican countries. International Monetary Fund Working Paper WP/13/236Washington, D.C..

[15]. Godwin etal. (2017). Effect Of Capital Formation On Economic Growth In Nigeria,Asian Journal of Economics,business and accounting 5(1):1-16,2017;Article NO.AJEBA.36075 ISSN:2456-639X.

[16]. GoR. (2019). 7 Years Government Programme: National Strategy for Transformation (NST 1).

[17]. Gujarat. (2004, p.797). Basic Econometrics, FourthEdition.

[18]. Hwang. (2011). Front-end planning implementation in Singapore: Status,importance, and impact', . Journal of Construction Engineering and Management, Vol. 138 No. 4, pp567-573.

[19]. Iamsiraroj. (2016). The foreign direct investment–economic growth nexus. International Review of Economics & Finance, 42 : p. 116-133.

[20]. IMF. (1993). International Monetary Fund, Balance of Payment Manual, 5th edition, .

[21]. Jha & Chockalingam. (2011). Prediction of schedule performance of Indian Construction Projects using an artificial neural network. . Construction Management and Economics Journal.

[22]. Jhinghan. (2006). Advanced Economic Theory (Micro and Macro) 12th Edition New Delhi.

[23]. John. (2012). Improving Development Project Implementation through Effective communications.

[24]. Johnson. (2006). "GFCF Inflows to the Transition Economies in Eastern Europe: Magnitude and Determinants", CESIS Electronic Working Paper Series, No. 59.

[25]. Keho. (2017). The impact of trade openness on economic growth: The case of Cote d'Ivoire, Cogent Economics & Finance, ISSN 2332-2039, Taylor & Francis, Abingdon, Vol. 5, Iss. 1, pp. 1-14,.

[26]. Khayroollo. (2012). Derterminants of foreign direct investment in Transition Economies:a case study of Kazakhstan and Uzbekistan,Unpublished Masters Thesis ,UMEA UNIVERSITET.

[27]. Kinuthia and Murshed . (2014). GFCF determinants: Kenya and Malaysia compared,Journal of Policy Modeling, 37: 388 – 400.

[28]. Kumo. (2012). Infrastructure investment and economic growth in South Africa: A granger causality analysis. African development Bank Group Working Paper Series, (160). .

[29]. Kusmadi. (1997). The Measurement Of Gross Domestic Fixed Capital Formation In Indonesia, Capital Stock Conference Central Bureau Of Statistics.Jakarta, India.

[30]. Kuznets. (1995). International Differences in Capital Formation and Financing"in: Capital Formation and Economic Growth, pages 19-111, National Bureau of Economic Research,

[31]. Mbogela. (2015). Trade openness: an African perspective: examining the determinants of trade openness and bilateral trade flows for theAfrican countries (Doctoral dissertation, University of Hull).

[32]. Michelis and george. (2004). Export,import and GDP growth:Causal relationship in six European Union countries. journal of EAconomic Asymmetries.

[33]. Mijiyawa. (2013). African's Recent Economic growth, what are the contributing factors? African Development Review.25(3):289-302.

[34]. Mutamuliza. (2016). Infrastructure development in Rwanda:Challenges and socioeconomic prospects. International Journal of Research in Social Sciences Vol. 6 Issue 12, December 2016, ISSN: 2249-2496 Impact Factor: 7.081 Journal Homepage: http://www.ijmra.us.

[35]. Nwaogu & Ryan. (2015). GFCF, foreign aid, remittance and economic growth in developing countries. Review of Development Economics, 2015. 19 (1): p. 100-115.

[36]. OECD. (2009). "Gross Fixed Capital Formation", in Measuring Capital - OECD

Manual 2009: Second edition,OECD Publishing, Paris. DOI: https://doi.org/10.1787/9789264068476-17-en.

[37]. Ramos. (2001). Exports, Imports, and Economic Growth in Portugal: Evidence from Causality and Cointegration Analysis. Economic Modelling, 18(2001). 613-623.

[38]. Rosa. (2009). The New growth theories and their Empirics. Department of economics,university of Bari, via Camillo Rosalba,53 Bari(italy),Glasgow G12 8RT(UK).

[39]. Sambasivan & Soon. (2007). Causes and effects of delays in Malaysian construction industry. International Journal of project management, 25 (5), 517-526.

[40]. Tahir etal. (2018). Macroeconomic determinants of trade openness: empirical investigation of SAARC region. J Asia BusStud 12(2):151–161.

[41]. Ugochukwu & Chinyere. (2013). The impact of capital formation on the growth of Nigerian economy. Research Journal of Finance and Accounting, 4(9): 36-42.

[42]. Wong & Vimonsatit. (2012). A study of the factors affecting construction time in Western Australia. Scientific Research and Essays, 7 (40), 3390-3398.

[43]. World Bank. (2020, July 8). Rwanda has achieved impressive development gains since the 1994 genocide and civil war. The World Bank supports the energy, agriculture and transport sectors. Retrieved from https://www.worldbank.org/en/country/rwanda/overview.

[44]. Zeqirii & Bajrami. (2016). "Foreign Direct Investment (GFCF) Types and Theories: The Significance of Human Capital"(2016). UBT International Conference. 23. https://knowledgecenter.ubt-uni.net/conference/2016/all-events/23.