

DETERMINANTS OF ECONOMIC GROWTH IN UGANDA.

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ABSTRACT

This study set out to provide evidence on the determinants of economic growth in Uganda while using gross fixed capital formation, general government final consumption expenditure and population growth as proxy variables. Time series data for the period of 1982-2020 obtained from the World Development Indicators (2020) was used. With the aid of unit root tests and a multiple linear regression model, the findings showed that population growth was stationary at level while economic growth, gross fixed capital formation and general government final consumption expenditure were non stationary at level hence differenced to achieve stationary. It was empirically confirmed that gross fixed capital formation had a positive and significant effect on economic growth, government final consumption expenditure had a positive and non-significant effect on economic growth while population growth had a negative but significant effect on economic growth.

For purposes of policy recommendation, reduction of interest rates, improvement in technological developments should be done to encourage investments. Furthermore, in order to reduce the ever-increasing population, government should provide affordable education in order to keep the girl child in school thus reducing early marriages and child births.

Key words: population growth rate, gross fixed capital information and government final consumption expenditure

Background to the study.

Economic growth is one of the most important indicators of a healthy economy. It refers to an increase in the production of economic goods and services, compared from one period of time to another (Pred, 2017). The Gross domestic product is a measure for the economic activity and it is calculated by expenditure or production approach. According to the expenditure approach, the Gross domestic product is sum of following factors: the final consumption expenditure and gross capital formation (Blaževski, 2018)

The Solow model, postulates that economic growth is attributed to accumulation of human capital as well as physical capital (Shahzad et al., 2022). This model provides an important cornerstone for understanding why some countries flourish while others are impoverished. It comprises four determinants of economic growth; initial income, rates of human and physical capital accumulation and population growth with the savings rate as a key factor in determining the level of capital intensity (Lilian, 2020). A higher savings rate leads to growth of investments and hence a higher level of production. Population growth in the Solow's theory is also one of the reasons for continued economic growth in the stable condition of the economy. However, if population growth is not accompanied by an increase in investments, it will lead to a reduction in the capital stock per worker. Thus, the theory of R. Solow explains that countries with higher population growth rates have lower capital-labor ratio, and hence - lower incomes. Therefore Governments can affect growth through investment in machines, skills, and technology.

There are many studies focused on the analysis of the relationship between population growth and economic growth. However, there is no consensus among researchers about whether population growth has positive, negative or no effects on economic growth (Garza-Rodriguez et al., 2016). There are mainly three schools of thought regarding the relationship between population growth and economic growth. The first one is the orthodox (or Malthusian) vision, which states that rapid population growth leads to lower economic growth and poverty (Oladimeji, 2017). The second one, the Revisionist school, takes the opposite view, arguing that higher population growth

increases the stock of human capital, thus contributing to economic growth. Finally, the Transition theory maintains that population growth is in part due to changes in income that is to say populous countries are populous as a result of being economically poor. A low-income country may have the option of effectively promoting the reduction of fertility in order to attain economic growth (Coale & Hoover, 2015)

GDP Growth Rate in Uganda averaged 1.56 percent from 2008 until 2020, reaching an all-time high of 8.20 percent in the third quarter of 2020 and a record low of -5.60 percent in the first quarter of 2020. Nampiina (2019) further indicates that gross fixed capital formation can spur economic growth significantly and to increase capital formation, government needs to generate savings and investments based on government policy. Population growth will also lead to economic growth in Uganda with more people able to produce more goods.

Problem Statement.

Although Uganda has recently experienced excellent economic growth and poverty reduction, it currently has one of the highest population growth rates in the world which, due to the inherent demographic momentum, will persist for some time to come (World Bank, 2017). This growth has influenced investors to conclude that such an increase will cause more absolute economic hardship in the country leading to reduced possibility of profitability of investment yet on the other hand, gross fixed capital formation which is the major component of domestic investment is seen as an important process that could accelerate economic growth. However, effort is required to cut general consumption in favor of investment expenditure. According to (Mazorodze, 2018), testing this claim requires separating the effects of government general consumption and government investment expenditure on economic growth thus the need for this study.

Specific objectives

1. To determine the effect of investment on economic growth.
2. To determine the effect of population growth on economic growth.

3. To determine the effect of general government final consumption expenditure on economic growth.

Research hypothesis.

Ho: Investment has no significant effect on economic growth.

Ho: Population growth has no significant effect on economic growth.

Ho: General government final consumption expenditure has no significant effect on economic growth.

Methodology

Research design.

Data source.

The analysis used annual time series secondary data starting from 1982-2020 in Uganda. The secondary data set consists of Gross Domestic Product, Investment also called Gross Fixed Capital Formation, General Government Final Consumption Expenditure and Population Growth observations obtained from world development indicators (2020).

Econometric model.

Model specification.

The econometric model is;

GDP=f (investment, population growth, general government final consumption expenditure) which can be expressed in linear form as;

$$GDP_t = \beta_0 + \beta_1 INV_t + \beta_2 PP_t + \beta_3 GGFCE_t + u_t$$

Where

GDP- economic growth (current US\$)

INV- investment (current US\$)

GGFCE- general government final consumption expenditure (current US\$)

PP- population growth

t-time series observations for the period 1980-2020.

U-error term which contains other variables that affect economic growth

Estimation Techniques.

Descriptive Analysis.

The time series data was descriptively analyzed to ensure normality of distribution. These include measures of central tendency (mean, median and mode) and a measure of variability (standard deviation, Skewness and kurtosis)

Correlation Analysis.

Correlation tests were carried to determine whether a statistical relationship exists between the variables and can one variable be predicted from another.

Diagnostic tests.

As a pretest for time series data, stationary tests were carried out using unit root tests.

Further, to prove the authenticity of the model and credibility of the empirical results, regression analysis, Multicollinearity test, normality test, heteroskedastic tests and auto correlation tests were applied to ensure the stability of the model over time

RESULTS

Descriptive Analysis.

Table 1 presents the summary statistics of the data used in this study and its characteristics that is, measures of central tendency and measures of variation. It was found that average growth rates are 22.933 percent, 21.181 percent, 20.675 percent and 17.014 percent for the variables LNGDP, LNGFCF, LNGGFCE and LNPPLN respectively.

Table 1: Descriptive Statistics**Table 1 Descriptive Statistics**

	LNGDP	LNGFCF	LNGGFCE	LNPPLN
Mean	22.93322	21.18136	20.67478	17.01381
Median	22.59644	20.89823	20.62902	17.00964
Maximum	24.35028	22.90287	22.17993	17.63851
Minimum	21.50144	18.98599	19.24778	16.39739
Std. Dev.	0.902871	1.228150	0.840882	0.365873
Skewness	0.294077	0.081753	-0.024348	0.007094
Kurtosis	1.702550	1.730715	1.828418	1.862632

Source: Author's computation.

The measures of variability were obtained by standard deviation which indicates that there were no wide variations among the data evidenced by the relatively small standard deviations. These include 0.903 percent, 1.228 percent, 0.841 percent and 0.366 percent for the variables LNGDP, LNGFCF, LNGGFCE and LNPPLN respectively.

Correlation Analysis.

Correlation tests are carried out to determine the relationship between the dependent and independent variables. Table 2 presents the correlation matrix for the variables of this study with LNGDP as the dependent variable.

Table 2 Correlation Matrix

	LNGDP	LNGFCF	LNGGFCE	LNPPPLN
LNGDPP	1.000000			
LNGFCF	0.884001	1.000000		
LNGGFCE	0.484850	0.423503	1.000000	
LNPPPLN	-0.009526	-0.074402	-0.007954	1.000000

Source: Author's computation

It is evident that there exists a strong positive relationship between LNGDP and LNGFCF as the correlation coefficient is 0.8840, a weak positive relationship between LNGDP and LNGGFCE as the correlation coefficient is 0.4849 and a negative relationship between LNPPPLN and LNGDP as the correlation coefficient is -0.0095

Unit Root Tests.

Prior to analysis of time series data, it is necessary to carry out unit root tests to determine whether the variables are constant over time. This is to prevent spurious results. One of the variables was found not to have a unit root at level while three of the variables were found to have a unit root at level but are differenced to induce stationarity. This implies LNPPPLN was integrated of order zero and LNGDP, LNGFCF, LNGGFCE were integrated of order one.

Table 3 Augmented Dickey Fuller Test for LNGDP at Level and First Difference.

At level			
ADF Test Statistic	-2.4249	5% Critical Value	-3.5366
At first difference			
ADF Test Statistic	-4.3750	5% Critical Value	-2.9434

Source: Author's computation.

Ho: LNGDP has a unit root.

The tau test statistic (-2.4249) in absolute terms is less than the 5% critical value(-3.5366) in absolute terms thus we accept the null hypothesis that LNGDP has unit root and conclude that LNGDP is non-stationary at level hence not I(0).

Upon differencing, LNGDP is stationary since the tau test statistic (-4.3750) in absolute terms is greater than the critical value at 5% (-2.9434) in absolute terms hence we reject the null hypothesis and conclude that LNGDP is stationary at first difference thus I (1).

Table 4 Augmented Dickey Fuller Test for LNGFCF at Level and First Difference.

At level			
ADF Test Statistic	-2.4830	5% Critical Value	-3.5366
At first difference			
ADF Test Statistic	-5.5574	5% Critical Value	-2.9434

Source: Author's computation.

Ho: LNGFCF has a unit root.

The tau test statistic (-2.4830) in absolute terms is less than the 5% critical value (-3.5366) in absolute terms thus we accept the null hypothesis that LNGFCF has a unit root and conclude that LNGFCF is non-stationary at level hence not I(0).

Upon differencing, LNGFCF is stationary since the tau test statistic (-5.5574) in absolute terms is greater than the critical value at 5% (-2.9434) in absolute terms hence we reject the null hypothesis and conclude that LNGFCF is stationary at first difference thus I(1).

Table 5 Augmented Dickey Fuller Test for LNGGFCE at Level and First Difference

At level			
ADF Test Statistic	-3.2797	5% Critical Value	-3.5331
At first difference			
ADF Test Statistic	-6.8908	5% Critical Value	-2.9434

Source: Author's computation.

Ho: LNGGFCE has a unit root.

The tau test statistic (-3.2797) in absolute terms is less than the 5% critical value (-3.5331) in absolute terms thus we accept the LNGGFCE has a unit root and conclude that LNGGFCE is non-stationary at level hence not I (0).

Upon differencing, LNGGFCE is stationary since the tau test statistic (-6.8908) in absolute terms is greater than the critical value at 5% (-2.9434) in absolute terms hence we reject the null hypothesis and conclude that LNGGFCE is stationary at first difference thus I (1).

Table 6 Augmented Dickey Fuller Test for LNPPLN at Level.

At level			
ADF Test Statistic	-4.9499	5% Critical Value	-3.5684

Source: Author's computation.

Ho: LNPPLN has a unit root.

The tau test statistic (-4.9499) in absolute terms is greater than the 5% critical value (-3.5684) in absolute terms thus we fail to accept the unit root and conclude that LNPPLN is stationary at level hence I (0).

Findings have shown that the variables are integrated of different orders.

Regression Analysis**Table 7 Regression Model with LNGDP as the dependent variable.**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.48540	2.985429	5.856914	0.0000
DLNGFCF	0.909451	0.097097	9.366392	0.0000
DLNGGFCE	0.158250	0.107705	1.469301	0.1507
LNPPPLN	-1.004324	0.278486	-3.606376	0.0010
R-squared	0.976585	Mean dependent var		22.93322
Adjusted R-squared	0.974578	S.D. dependent var		0.902871
S.E. of regression	0.143957	Akaike info criterion		-0.941696
Sum squared resid	0.725322	Schwarz criterion		-0.771074
Log likelihood	22.36307	F-statistic		486.5875
Durbin-Watson stat	0.404429	Prob(F-statistic)		0.000000

Source: Author's computation.

The R-Squared value is 0.977 which signifies that approximately 98 percent of the variations in economic growth are jointly explained by variations in gross fixed capital formation, general government final consumption expenditure and population growth. 2 percent is explained by other variables contained in the error term thus not included in the model. The R-Squared is high which implies that the data is fitted nicely thus a good fit.

Keeping other factors constant, a 1percent increase in gross fixed capital formation will on average lead to a 0.909 percent increase in economic growth. The findings show that gross fixed capital formation has a positive and statistically significant effect on economic growth as similar to those of Ncanywa & Makhenyan (2016).

Keeping other factors constant, a 1percent increase in general government final consumption expenditure will on average lead to a 0.158 percent increase in economic growth. The findings show that general government final consumption expenditure has a positive and statistically non-significant effect on economic growth as similar to those of Connolly & Li (2016).

Keeping other factors constant, a 1percent increase in log of population growth will on average lead to a 1.004 percent decrease in economic growth. This implies that population growth has a negative but statistically significant effect on economic growth as similar to the findings of Ahmed & Ahmad (2016)

The F statistic shows that all variables jointly have a significant effect on the economic growth.

Multicollinearity.**Table 8 Variance Inflation Factors (VIF)**

Variable	VIF	1/VIF
GFCF	1.02	0.975810
GGFCE	1.02	0.977285
PPLN	1.01	0.992788
Mean VIF	1.02	

Source: Author's computation.

The mean VIF is below 10 implying that there is no perfect Multicollinearity among the explanatory variables.

Normality test.

Table 9 Jarque-Bera Normality Test.

Variable	Jarque-Bera	Probability
Residuals	3.847489	0.146059

Source: Author's computation.

Ho: the variables are normally distributed

Since the jarque-Bera statistic (3.847) is greater than 0 and the p- value $0.146 > 0.10$, we accept the null and conclude that the variables are normally distributed.

Autocorrelation

Table 10 Test for Autocorrelation

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.695958	Probability	0.508794
Obs*R-squared	1.711940	Probability	0.424871

Source: Author's computation.

Ho: There is no auto correlation.

The null hypothesis of presence of no auto correlation is accepted since the probability (0.508794) is greater than 0.05.

Heteroskedasticity

Table 11 Test for heteroskedasticity.

Heteroskedasticity Test: Bruesch Pagan Godfrey			
F-statistic	1.905314	Prob. F(3,35)	0.1467
Obs*R-squared	5.475048	Prob. Chi-square (3)	0.1401
Scaled explained SS	1.890800	Prob. Chi-Square (3)	0.5947

Source: Author's computation.

H0: There is no heteroskedasticity

The results show that the observed probability Chi-Square value (0.1401) is greater than 0.05 critical values. This means that there is no heteroskedasticity

Conclusion.

The study results confirmed that gross fixed capital formation had a positive and significant effect on economic growth, general government final consumption expenditure had a positive and non-significant effect on economic growth while population growth had a negative but significant effect on economic growth.

Recommendation.

The government of Uganda should provide universal education in order to keep the girl child in school thus reducing early marriages and child births.

Lowering of interest rates should be adopted since it reduces the cost of borrowing and increases consumer spending and investment thus leading to economic growth.

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