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The Macroeconomic Determinants of Economic Growth in Uganda a Case Study Of Wakiso Distict

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Abstract: *Using a cointegration approach, the research examined at the macroeconomic variables impacting economic growth in Uganda. For the analysis of the macroeconomic factors influencing Uganda's economic growth, the researcher used statistical software from the E - views 11 student version. The study's objectives were to look into the variables that influence gross domestic product (GDP) in Uganda, to see whether the volume of foreign direct investment flows affects GDP there, to see if inflation rates affect GDP here anyway, and to see if exchange rates affect GDP there. The primary objective of this research was to use the Johansen method of cointegration to analyze the key macroeconomic factors that influence economic growth in Uganda between 1990 and 2019. All The real effective exchange rate is the only variable that is integrated at first order, hence the Johansen's cointegration method was utilized. In accordance with the study, real effective exchange rate has a negative impact on growth in real gross domestic product per capita, while foreign direct investment (as a proportion of Gdp) and inflation (consumer prices) have positive effects. In the long run, Uganda's real GDP per capita increase is significantly influenced by the real effective exchange rate. Inflation (consumer prices) has become statistically significant factor in determining the rise of real gross domestic product per capita in the short run. The following recommendations for policy are offered in light of the findings: The Bank of Uganda should utilize monetary policy to boost aggregate demand in order to stimulate the economy because there is a significant positive relationship between inflation and growth in gross domestic product per capita. It is therefore advised that the government of Uganda continue to attract more foreign capital inflow through trade liberalization if it is to achieve its growth target of 8 percent growth rate per annum because there is a positive relationship between FDI and gross domestic product per capita growth. The most significant political result from the research on the inverse relationship between economic expansion and exchange rate, however, points to the significance of an exchange rate management framework that supports Uganda's current inflation targeting regime. Policymakers in Uganda must prevent increasing fluctuations in the exchange rate by taking into account its detrimental impact on economic growth rather than entirely liberalizing it within the framework of the inflation targeting method adopted.*

Keywords: GDP, Inflation, consumer price index

Background information

Human civilization has always centered upon the pursuit of economic development. Economic growth remains to be at the forefront of public concern even in today's globalized world and dominates discourse in the mainstream media. The term "growth miracles" has been used to describe economies with incredibly high growth rates.

Introduction to the theory

A significant amount can be learned about economic growth from macroeconomic theory. The most well-known economic growth model, also referred to as the Solow Model, holds that advancements in physical capital, but instead of changes in the stock of capital or labor, are what accounting for economic growth (Romer :2010). Although other dominant theories of economic growth also reach the same conclusion—that technological evolution stimulates economic growth also draw other conclusions that deviate from other models. The Ramsey Model, for instance, counters the Solow model by arguing that capital accumulation represents technological progress and hence promotes economic growth (Growth: 2017).

Based on the so-called endogenous growth theories, which include models by Barro and Lucas, economic growth is produced among other things by the accumulation of physical capital, human capital, and government activity. Because there are so many competing possibilities, it is necessary to do empirical study to determine the variables that impact the economic and social development of particular countries or areas. The ability to identify nation-specific characteristics that promote economic growth by going beyond existing theories is another advantage of empirical studies.

Global economic expansion

Growth advocates and development analysts hold the view that removing social vices like poverty demands continued economic progress on a national, regional, and global scale. Due to this, multilateral agencies like the World Bank and the UN have placed a greater emphasis on actions that promote economic growth. The world economy was estimated to increase by 3.1 percent in 2015

and 3.3 percent in 2016, according to the United Nations Global Economic Outlook for 2015. It is difficult to accomplish this kind of growth, specifically when global economic growth depends on national and regional growth on one another. international factors on the other hand. The world economy only registers positive economic growth when the positive growth in some regions or nations is greater than the negative growth experienced in other regions or nations.

Economic growth of Uganda

Uganda's economy has grown over time, shifting from cotton as a key export during colonial times to coffee in the 1950s. The economy had significant growth during this time, with agriculture consuming the majority of it. The economy also benefited from the nascent industrial sector, which focused on food processing for export (Okidi et aI, 2016). This expansion slowed in the late 1950s as a result of fluctuating global market circumstances that diminished export revenues and political pressure from nationalist movements that were developing across much of Africa as the nations struggled for independence. Odaet (2018) argues that for the first five years after gaining its independence in 1962, Uganda's economy experienced fast expansion, with GDP—which includes engaged in agriculture by about 6.7 percent annually. Commercial agriculture made up more than one-third of the GDP by the end of the 1960s, and new food processing enterprises were largely responsible for the increase in industrial output to the almost nine percent of the GDP. Nearly half of the overall output was still contributed by the wholesale and retail commerce, tourism, transportation, and telecommunications sectors (Odaet, 2018).

Early in the 1970s, the government anticipated yearly economic growth rates of around 6%, but civil war and political unrest nearly wiped out Uganda's economy. From 1972 to 1976, GDP decreased annually, and only slightly increased in 1977, when the price of coffee around the world. The government's ongoing expropriation of business assets, decrease in foreign direct investments, lack of effectiveness in public services and parastatals, expropriation of Asian property, and degradation of the pool of professionals and experienced workers were the main causes of the negative growth's return. Between 1990 and 2014, the monetary GDP was estimated to have decreased by 3.1 percent annually as a result of worsening terms of trade.

Overview of the problem

Uganda’s economy is striving to achieve Millennium Development Goals (MDGs) by 2040 and 8 percent growth rate of GDP per annum. However, Uganda's gross domestic savings as a percentage of GDP are rather low, so it is unlikely that mobilizing the small domestic resources will allow it to achieve this growth rate (BOU, 2000 and 2007). Besides that, domestic savings and government revenue have greatly reduced while private investment has continued to increase, resulting in a domestic imbalance (resource gap) that would ultimately spill over into an external imbalance of imports exceeding exports, likely to result in a foreign exchange gap and balance of payment issues (UBOS, 2010).

In response to this lack of resources, policy makers have placed a great deal of emphasis on the issue of international financial intermediation, and FDI in particular, as a temporary measure to achieve strong and sustainable economic growth (Obwona, 2001 and UNCTAD, 2005). After realizing the constraints of domestic capital, the present administration has expanded the availability of various economic sectors to foreign investors. A variety of investment and policy incentives have been announced by the government, including reduced import and export taxes, reduced corporate tax rates, including tax holidays, the creation of a one-stop shop to expedite the approval and certification of investments, a lower minimum capital requirement, market expansion through economic integration, and assurances of political and economic stability. Therefore, according to Brooks and Sumulong, theoretically, FDI might perhaps have a positive effect on the economy by supplying capital and technologies, stimulating competition, boosting local investments, and finally promoting economic growth (2003). However, a joint survey study by the Bank of Uganda, the Uganda Investment Authority, and the Uganda Bureau of Statistics found that Uganda's economic growth is still modest and sluggish, ranging between 3.5 and 5.4 percent yearly (2001-2008). For Uganda, the benefits of FDI are still not apparent, especially in terms of spurring economic growth. Therefore, it is worth taking a look at what causes Uganda's economic growth. It is also crucial to understand the primary objectives and financial interests of foreign investors in a country's economy. Finding the variables that influence Uganda's economic growth is so important.

Specific objectives

1. To determine whether the level of foreign direct investments flows influences gross domestic product (GDP) in Uganda.
2. To ascertain whether inflation rate influences economic growth (GDP) in Uganda from.
3. To ascertain if exchange rates determine economic growth in Uganda.

Hypothesis of the study

Ho: Uganda's GDP growth is not affected by the quantity of FDI that enters the country.

Ha: In Uganda, the rate of economic growth (GDP) is determined by the size of FDI.

Ho: The rate of inflation in Uganda has no impact on GDP growth.

Ha! In Uganda, the rate of inflation affects GDP growth.

Ho: In Uganda, the GDP growth is independent by exchange rates.

Ha: Uganda's GDP growth is affected by exchange rates.

METHODOLOGY

Model specification

Macroeconomic theory, such as the classical, neoclassical, and new growth theories, has identified a variety of variables that influence a nation's rate of economic expansion. Natural resources, investments, human capital, innovation, technology, economic policies, governmental considerations, foreign aid, trade openness, institutional framework, foreign direct investment, political concerns, sociocultural considerations, geography, demography, and a host of other factors are included in this list. The study will take these factors into consideration in order to investigate the empirical evidence of the macroeconomic determinants of economic growth in Uganda.

The researchers define the economic growth function for Uganda as follows, substantially following Lucas (1988), Real (GDP) per capita growth depends on FDI from abroad, inflation, and currency exchange rates.

It is mathematically expressed as follows:

$$GDP = f\ (FDI, INF, REEX) \ \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\ (1)$$

Thus, our growth function becomes

$$GDP_t = \beta_o + \beta_1 FDI_t + \beta_2 INF_t + \beta_3 REER_t + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

Sims (1980) argues that the huge percentage of macroeconomic time series variables are endogenous, meaning they influence each other. As a result, Sims (1980) suggests that the above multivariate function should be estimated using Johannsen cointegrating approach. He also asserts that because current period variables depend on earlier values, monetary policy variables must be modeled using lags.

a description of the multivariate function's variables.

Gross domestic product (GDP), often referred as GDP per capita, is a metric of a government's economic output that takes into account its demographic. It divides the GDP of the nation by its overall population.

Foreign direct investment (FDI), measured in current dollars, is an investment produced by a firm headquartered in another nation that holds a majority stake in a business in another country. Effective exchange rate, or REEX, is an indicator that measures a currency's strength against with a basket of other frequently used currencies, particularly the US dollar. The weighted average of a country's currency in relation to an index or basket of other important currencies is known as the real effective exchange rate (REER). The relative trade balance of each country's currency is contrasted to the trade balance of every other country in the index to calculate the weights.

The percentage at which a dollar cheapens over time is called the inflation rate, or INFL. The fact that the consumer price index (CPI) is rising over this time period is strong evidence of this devaluation.

Time lag = t

The stochastic term _t is assumed to be normally distributed, independently distributed, with a zero mean I and constant variance, δ2 which captures all other explanatory variables which influence economic growth but are not captured in this model. β o, β 1, β 2, β 3 are the partial elasticities of GDP (economic growth) with respect to 〖FDI〗 t, 〖INF〗 t, and 〖REER〗 t respectively**.**

The error correction term lagged one period, which integrates short run dynamics in the long-run growth function is shown below through the error correction model (ECM):

$$\Delta GDP_t = \alpha_1 + \sum_{i=1}^{p} b_{2i}\, \Delta GDP_{t-1} + \sum_{i=0}^{p} c_{3i}\, \Delta FDI_{t-1} + \sum_{i=0}^{p} d_{4i}\, \Delta INF_{t-1} + \sum_{i=0}^{p} e_{5i}\, \Delta REEX_{t-1} + \lambda_6 ECM_{t-1} + \varepsilon_{2t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\ (3)$$

Where ECM (t-1) represents the error correction term (the residuals generated from the estimated cointegrating model of equation) (3). The feedback and adjustment effect known as the ECM shows how much of the unbalance is being corrected. When a relationship is highly statistically significant, it further illustrates the regarding effective of that link (Bannerjee, et al., 1998). As shown in the equation, the composition of _2t is similar to that of _t. (3). The first-differenced form of the model's variables is denoted by the symbol. The impact multipliers, which evaluate the immediate effect a change in the explanatory variable has on a change in the dependent variable, are the correlation coefficient of the various explanatory variables b 2i, c 3i, d 4i, and e 5i. The speed of the adjustment parameter is denoted by 6. The value of λ must be between the range -1 ≤λ_6≤ 0 and must be statistically significant.

Estimation procedure and technique

Lag length determinations

The lag length of a model should be chosen so that it generates residuals with minimum autocorrelation, as according Chareza and Deadman's (1997) suggestions. This is due to the risk of inconsistent least squares calculations caused by serial correlation. While paying proper attention to serial correlation, the study mainly applied likelihood ratio (LR) tests in the manner Enders (2004) described. Below is the likelihood ratio test formula:

LR=(In|ΣRR|-In|ΣUR|) …….(4a)

LR=(T-C) (In|ΣRR|-In|ΣUR|) …….(4b)

While In|RR| and In|UR| are the natural logarithms of the determinants of the variance/covariance matrices of the residuals in the restricted and unrestricted VARs, respectively, T is the number of usable observations, C is the number of parameters estimated in each equation of the unrestricted model, and the basic LR statistics are in Equation (4a), and (4b). If the calculated value of the statistic is less than the critical value at a pre-specified significant level, we fail to reject the null hypothesis. The restricted (RR) equation is turned into unrestricted (UR) equation and the test continues until the appropriate lag is established (Enders, 1995). For Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC) statistics, selection criterion is based on the criterion that yield the smallest lag order that account for serial correlation of any order without much loss in the degrees of freedom.

Unit Root test for Stationary

If a series' mean and variance remain constant over time, it is termed to be stationary, and the covariance value between two time periods only depends on the interval between the two time periods and not the actual time at which the covariance is computed (Gujarati, 2005). The means, variances, and covariances of the time series will not be well described if they are not stationary.

Ordinary Least Square (OLS) techniques can only yield meaningful results when the data are stationary, according to Maddala (1977). In order to safeguard against false results, a non-stationary time series is made stationary before analysis. Since the researcher employed a standard cointegration approach, the test for stationarity still seems to be important. A more intense dickey-fuller was used to test for the presence of unit roots:

Augmented dickey-fuller test

Before running a model, the researcher used Augmented Dickey-Fuller (ADF) test to test for the presence of unit root. Dickey-Fuller (DF) test is a test against the null hypothesis that there is a unit root series integrated of orders one.

The test equation is of the form:

$$\Delta X_t = r_o + S_{t-1} + r_1(t) + V_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (5)$$

The DF test is the test of coefficient β in the equation (5). X_t Is any of the variables to be used in the model? The ADF test is the same as the DF except that augmentation in terms of lags of X_t are incorporated. The equation is of the form:

$$\Delta X_t = r_o + S_{t-1} + r_1(t) + \sum_{t=1}^{k} s\Delta X_{t-1} + V_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6)$$

When the appropriate lag length I is established, any autocorrelation in X t is abolished, and the error term V t is spread as white noise. It is thought to be a better test than the previous one due to this reason. With E - views, you can choose whether to include a constant, o, the linear trend, t, or neither in the equation.

Co-integrating Tests

The number of long-run equilibrium relations between both the variables can be estimated by applying one or more tests of cointegrating when the variables in a given vector are non-stationary in their levels and integrated of the same order. The Johansen

(1988) approach is used in this study to test for cointegrating correlations among variables. Juselious (1990) and Johansen (1991) parameterized the VAR model to yield the following tests equation: $\Delta y_t = \Pi y_{t-1} + \sum_{i-1}^{p-1} r_t \Delta y_{t-1} + \beta_{x_t} + e_t$; $\Pi = \sum_{i=1}^{p} A_i - 1$; $r_i = -\sum_{j=i+1}^{p} A_i$ … … … … … … … … . (7)

Where y t is a vector of non-stationary variables, x t is a vector of deterministic variables such variables, patterns, and dummy variables, and et is a vector of normally and independently distributed random variables, and are nxn matrices of coefficients.

The volume of Cointegrating relations relies on the rank of a matrix. Rows of are the loading factors, which indicate the rate of adjustment of the dependent variables to their long-run equilibrium, and rows of s are the distinct number of Cointegrating relations.

Johansen (1990; 1995) developed multiple associated likelihood ratio (LR) test statistics to check for cointegration.

The first statistic is the trace statistic, which compares the alternative of k cointegrating relations, where k is the number of endogenous variables, to the null hypothesis of r cointegrating relations for r = 0, 1,..., k-1. For r Cointegrating relations, the trace statistic is computed as:

$$LR_{tr}(\frac{r}{k}) = -T\sum_{i=r+1}^{k} log(i-\}i) \text{ … . (8)}$$

Where i is the i-th largest eigenvalue of matrix in equation

The second statistic is the maximum eigenvalue, which test the null hypothesis of Cointegrating relations against the alternative of r+1 cointegrating relations. The statistic is:

$$LR_{max}\left(\frac{r}{r+1}\right) = LR_{tr}(\frac{r}{k}) - LR_{tr}(\frac{r+1}{k}) \text{ … … … … … … … … … … … … … … … … … … … (9)}$$

In this study, tests for Cointegration among variables were based on trace statistics and maximum eigenvalue statistics.

The LM Serial Correlation Test

If a variable is regressed on one or more repressors and the residuals are correlated, serial correlation in the regression is said to be present. The calculated regression coefficients may be linear, fair, consistent, and asymptotically normally distributed in the presence of serial correlation, but they are unproductive. In other words, they lack minimum variance. When serial correlation is found, the lag order must be changed so that all serial correlation in the residuals is taken into account by the final lag.

There are a number of tests that can be used to evaluate whether serial correlation exists. These include the Runs test, the Durbin-Watson test, the Breusch and Godfrey tests from 1978, and the Durbin-Watson test. In essence, the Runs test is a non-parametric test. The Durbin-Watson regression model has a number of constraints, including the need for an intercept, the stipulation that disturbances be produced by a first order autoregressive process and be normally distributed, the proscription of using lagged values of the dependent variable as explanatory variables, and the requirement that there be no missing values in the data. The limitations of the Durbin- Watson test are overcome by the Breusch (1978) and Godfrey (1978) Lagrange Multiplier (LM) tests for serial correction. The BG test permits the use of lagged values of the regressand as explanatory variables, serial correlation of an autoregressive scheme greater than one, simple or higher moving averages of the error terms, and lagged values of the regressed.

These are the steps for the BG test; assuming the regression $y_t = \bar{x}_t s + V_t$ … … … … … … … … … … … … … … … … … … … . (10)

The BG test for serial correlation is run from the auxiliary equation given as;

$$\hat{e} = \bar{x}_t[+\left[\sum_{i=1}^{p} r_i \hat{e}_{t-1}\right] \text{ … … … … … … … … … … … … … … … … … … … (11)}$$

Where ê are residuals from equation (11)

The BG LM test is conducted by regressing the residuals on the vector of the initial vector of explanatory variables $\bar{x}_t$ as well as the lagged residuals. BG LM test statistic is given as the product of the number of observations and the R2 from the auxiliary equation. The LM is asymptotically distributed as a chi-square statistics t^2(p), p is the maximum number of lags of the residuals in (11).

The Jarque-Bera Normality test

The test for normality is important because if the residuals are not normally distributed, statistical inference based on the t and f-statistics shall be invalid. It is also an indication that the model is incorrectly specified. The Jarque-Bera (1987) test of normality is

an asymptotic test or large sample test. It tests the joint hypothesis that there is no skewness in the series and that the series have a kurtosis of three, which implies that, the kurtosis is mesokurtic. The test statistic is given as: -

$$JB = n\left(\frac{s^2}{6} + \frac{(k-3)^2}{24}\right) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \quad (12)$$

Where n is the sample size; s is skewness and K is kurtosis. If the series is normally distributed the JB statistic is expected to be zero. The test specifies a null- hypothesis of a normally distributed series. Therefore, rejection of the null-hypothesis implies that the series are not normally distributed. In this study, normality test was conducted on the residual

Data source

This study used secondary annual data ranging from 1990 to 2019, extracted from World Bank's development indicators (WDI) accessed at http: data.worldbank.org/Uganda.

RESULTS

Descriptive Summary

Table 1 shows the descriptive statistics

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean		Std.	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
GDP_PCAP	30	-.15	8.04	89.15	2.9716	.38166	2.09045	.593	.427	-.138	.833
FDINV	30	-.14	6.48	86.99	2.8996	.32720	1.79213	.028	.427	-.218	.833
INF_CPI	26	-.29	15.13	163.88	6.3030	.77328	3.94297	.511	.456	-.143	.887
REER	30	90.18	239.63	3535.05	117.8349	5.54852	30.39049	2.599	.427	8.398	.833
Valid N (listwise)	26										

Table 1 provided the descriptive statistics for the variables used in this research. Real effective exchange rates, foreign capital investments, and GDP per capita growth are the variables with the most observations. They have 30 observations, opposed to inflation's 26 for the other variables with the fewest observations. The findings show that, among the study variables, the mean GDP per capita growth was 2.9716, with minimum GDP per capita growth of 0.15 and maximum GDP per capita growth of 8.04; the mean foreign capital investments were 2.8996 and 6.3030 for inflation; and the real effective exchange rate was 117.8349. All the variables are favorably skewed and within the acceptable range in terms of skewness.

Test for unit root

Granger et al. (1974) suggested that time series statistics econometric estimations run the risk of generating erroneous conclusions. Estimates will be inaccurate and biased if the variables are non-stationary. Therefore, it is essential to test for the existence of any trends or persistent patterns in data that might go against the assumptions of the Classical Linear Model (CLM) for this model. For the economic growth estimates in this study, we employed the Augmented Dicky-Fuller (ADF) unit root test.

Ho: The unit root of economic growth (growth in GDP per capita)
Ha: Economic growth (GDP per capita growth) has no unit root
Ho: Inflation, consumer prices have a unit root
Ha: Inflation, consumer prices have no unit root
Ho: Real effective exchange rate has a unit root
Ha: Real effective exchange rate has no unit root
Ho: Foreign direct investment has a unit root
Ha: Foreign direct investment has no unit root
Engle-granger Co-integration Analysis

Table 2: Results for Unit root test

Augmented Dickey Fuller					
	Test statistic	**1% critical**	**5% critical**	**10% critical**	**p-value for Z(t)**

Economic growth (GDP)	**-3.3507**	**-4.324**	**-3.5806**	**-3.2253**	**0.0789**
inflation, consumer prices	**-2.337177**	**-4.394309**	**-3.612199**	**-3.243079**	**0.4**
Real effective exchange rate	**-5.088003**	**-4.323979**	**-3.580622**	**-3.225334**	**0.0017**
Foreign direct investment	**-0.860586**	**-4.323979**	**-3.580622**	**-3.225334**	**0.9469**

Economic growth (GDP per capita growth)

Economic growth (GDP per capita growth) has a unit root, which means the series are non-stationary, because the ADF test absolute value is less than the absolute of critical value at the 5% level and the p-value (0.0789) is greater than 0.05 critical levels. As a result, the null hypothesis is accepted.

Inflation and retail prices

The absolute value of the Augmented Dickey-Fuller test statistic, -2.3372, is less than the 5% critical value, while the p-value (0.4), is higher than the 0.05 critical threshold. As a result, we could rule out the null hypothesis and arrived at the conclusion that either consumer price inflation or its level of non-stationarity has a unit root.

Rate of real effective exchange

Its absolute value is larger than 5%, as demonstrated by the augmented dickey-duller test result of -5.0880. Therefore, we reject the null hypothesis and conclude that the variable real effective exchange rate is stationary or has no unit root at levels.

Foreign direct investment

The Augmented Dickey-fuller test statistic -0.8606 shows that its absolute value is less than 5% critical value and also the p-value (0.9469) is greater than 0.05 critical levels. Therefore, we fail to reject the null hypothesis and conclude that the foreign direct investment has a unit root or is non-stationary at levels

Smoothening the Series through the first differences to make them make them stationary

Table 3: Results for Unit root test at first difference.

Augmented Dickey Fuller					
	Test statistic	**1% critical**	**5% critical**	**10% critical**	**p-value for Z(t)**
Economic growth (GDP)	**-5.955147**	**-4.33933**	**-3.587527**	**-3.22923**	**0.0002**
inflation, consumer prices	**-5.973722**	**-4.416345**	**-3.622033**	**-3.248592**	**0.0004**
Foreign direct investment	**-4.449685**	**-4.33933**	**-3.587527**	**-3.22923**	**0.0078**

Economic growth (GDP per capita growth)

The augmented dickey-duller test statistic (-5.9551), which indicates that its absolute value is larger than 5% of critical value and that the p-value (0.0002) is less than 0.05 crucial levels, demonstrates that these two levels are exceeded. Since the variable economic growth (GDP per capita growth) is stationary or does not have a unit root at the first difference, we reject the null hypothesis and come to the conclusion that the variable is integrated of order 1.

The augmented dickey-duller test result of -5.9737 indicates that both the p-value (0.0004) and absolute value (>5%) are below the 0.05 standard limits. The variable inflation, consumer prices is stable or does not have a unit root at the first difference, therefore we reject the null hypothesis and come to the conclusion that the variable is integrated of order 1

Foreign direct investment

The augmented dickey-duller test statistic -4.4497 shows that its absolute value is greater than 5% critical value and also the p-value (0.0078) is less than 0.05 critical levels. Therefore, we reject the null hypothesis and conclude that the variable foreign direct investment (% of GDP) is stationary or has no unit root at first difference hence the variable is integrated of order 1.

Autocorrelation/LM Serial correlation test

Breusch-Godfrey (1978) LM test is used to detect the presence of serial correlation in the residuals. The test is based on the null-hypothesis that there is no serial correlation up to a certain lag order h. The test is conducted up to lag order one since lag order one was selected by most criterions in lag selection criterion. The result is presented in Table below

Ho: There is no autocorrelation/ serial correlation

Ha: There is autocorrelation/serial correlation

Table 4: Breusch-Godfrey LM tests for autocorrelation

Lags (P)	Chi2	df	Prob>Chi2
1	0.281	1	0.5959

We could really rule out the null hypothesis that there is no serial correlation at lag 1 at the 5% level of significance based on the probability value in table 4.3.1 above because the P-Value (0.5959) is higher than 0.05. There is therefore no serial correlation in the residuals at lag order 1 as determined by the residual (1978) LM test for serial correlation. This demonstrates that all of the model's estimated coefficients are effective at lag order 1.

Selection criterion for lag length

It is crucial to choose the right lag length before the model is estimated. The lag should be chosen to minimize degrees of freedom lost while correcting for serial correlation in the residuals. Table 4 below displays the outcomes of the

Table 5: VAR lag order selection criterion

LAG	LOGL	LR	FPE	AIC	SC	HQ
0	-318.5893	NA	1142911	28.1382	28.38505	28.20028
1	-265.4559	78.54509*	105255.4*	25.69181*	27.17289*	26.06430*
2	-240.5743	25.96336	152877	25.70211	28.41743	26.38501

Results in table 4.4.1 show that the sequential modified LR test statistic (LR), Final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criteria (SC) and Hannan Quinn information criterion (HQ) selected lag length 1. This study estimates VAR of lag order 1 as suggested by all criterions.

Cointegrating Test

After categorizing variables as integrated of order I (0), I (1), I (2), and so forth, it is then possible to build models that result in stationary relations between the variables and allow for standard inference. Modeling meaningful empirical relationships needs testing for co-integration. It follows that you cannot model the long-run if the variables have different trends processes, and that there is typically no sound basis for extrapolating from standard distributions. It is vital to keep using variables in differences if co-integration is absent at the level level. The Johansen (1991) process is the technique used in this research to count the number of Cointegrating relations in a vector of variables that are integrated of the different order. Given the result of the unit root tests above; the numbers of Cointegrating vectors are tested on the variables; GDP PCAP, FDI, REEX and INFL CPI using Maximum Eigen value and Trace Statistics. The results of the Cointegrating tests are given in Tables below.

Table 6: Johansen Cointegrating test using trace test statistics

Hypothesized No. of CE(s)	Eigen value	Trace statistic	0.05 critical value	Prob.**
None*	0.71339	75.80179	69.81889	0.0154
At most 1	0.658492	47.06021	47.85613	0.0593
At most 2	0.488373	22.34937	29.79707	0.2795
At most 3	0.001377	0.031686	3.841465	0.8587

Table 6: Johansen Cointegrating test using Maximum Eigen value statistics

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 critical value	Prob.**
None	0.71339	28.74158	33.87687	0.1814
At most 1	0.658492	24.71084	27.58434	0.1118
At most 2	0.488373	15.41366	21.13162	0.261
At most 3	0.001377	0.031686	3.841465	0.8587

The trace statistics test indicates that there is a Cointegrating equation at 5% critical level in table 6 and the maximum Eigen value test statistics in table 5 indicate that there is no Cointegrating relationship among variables at 5% level. Since the trace statistics is more superior to the maximum Eigen values in table 5. This study relies on the trace statistics. It is therefore convenient to run restricted VAR (vector error correction model) other than unrestricted vector autoregressive model (VAR).

Regression analysis

Short run GDP per capita growth model estimates

Ho: Economic growth (GDP) does not depend on foreign direct investment
Ha: Economic growth (GDP) depends on foreign direct investment
Ho: Economic growth (GDP) does not depend on inflation
Ha: Economic growth (GDP) depends on inflation
Ho: Economic growth (GDP) does not depend on real exchange rate
Ha: Economic growth (GDP) depends on real exchange rate

Table 7: Short run GDP per capita growth model estimates

Dependent Variable: GDP_PCAP
Method: Least Squares
Date: 06/05/22 Time: 23:57
Sample(adjusted): 1994 2019
Included observations: 26 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	0.120120	0.281012	0.427454	0.6730
INF_CPI	0.095313	0.120347	0.791985	0.4365
REER	0.018710	0.008373	2.234583	0.0355

R-squared	0.098436	Mean dependent var	3.054179
Adjusted R-squared	0.020039	S.D. dependent var	2.130908
S.E. of regression	2.109449	Akaike info criterion	4.438897
Sum squared resid	102.3448	Schwarz criterion	4.584062
Log likelihood	-54.70566	F-statistic	1.255615
Durbin-Watson stat	1.758391	Prob(F-statistic)	0.303710

The R-Squared score (0.098436) indicates a poor match, with foreign direct investments (FDI), inflation, and real exchange rate contributing for 9.84 percent of the difference in economic growth while holding other factors constant.

The coefficient of 0.120120 implies that, if all other things were held constant, an increase in foreign direct investment would typically result in a rise in GDP of 0.120120. Since the P-Value (0.6730) is bigger than 0.05 and this is statistically insignificant, the null hypothesis is accepted, and it is determined that foreign direct investment is independently of economic growth (GDP).

According to the coefficient of 0.095313, a unit increase in inflation would generally result in an increase in GDP of 0.095313 when other variables remained constant. This is statistically insignificant since the P-Value (0.6730) is greater than 0.05, thus the null hypothesis is accepted and the conclusion made that inflation does not depend on Economic growth (GDP).

According to the coefficient of 0.018710, a unit rise in the real effective exchange rate would generally result in a 0.018710 increase in GDP, holding other variables remain constant. Since the P-Value (0.0355) is less than 0.05 and this is statistically insignificant, the null hypothesis is accepted, and it is determined that the real effective exchange rate depends on economic growth (GDP).

Long run GDP per capita growth model estimates

Table 8: Long run GDP per capita growth model estimates

Cointegrating Eq	GDP_PCAP_ (-1)	C	FDI (-1)	REER (-1)	INF_CPI (-1)
CointEq1	1	0.353798	0.178457	-0.074245	0.065831
			(-0.027193)	(-0.01808)	(-0.14107)
			[0.65627]	[-4.105371]	[0.46664]

Foreign Direct Investment (FDI)

There is a positive relationship between gross domestic product (GDP), which is the measure of economic growth, and foreign direct investment, as evidenced by the findings of the long-run relationship between the dependent variable and the independent variables (FDI). Consequently, an increase of one percent in foreign direct investment (FDI) per unit will lead to a boost of 17.85% ceteris paribus in economic growth. As tcal (0.65626) is less than ttab, there is no statistically significant connection between the two (2.101). The estimate of foreign direct investments is statistically insignificant at the 5% level of significance according to the long run equation for model's t test criterion (that is, tcal (0.65626) is smaller than ttab (2.101) @ df 28).

Real effective exchange rate (REER)

There exists a negative relationship between gross domestic product (GDP) which is the economic growth and real effective exchange rate (REER). It means that a unit increase in real effective exchange rate (REER) by one percent will lead to a corresponding decrease in Economic growth by 7.4% holding other factors constant. This relationship is statistically significant since the tcal (4.1053) is greater than ttab (2.101). Using the t test criteria of the long run equation for model (that is tcal (4.10537) is greater than ttab (2.101) @ DF 28), we reject the null hypothesis and conclude that the estimate real effective exchange rate is statistically significant at the 5% level of significance. This implies that real effective exchange rate has a significant effect on the gross domestic product in Uganda.

Inflation, consumer prices (INF_CPI)

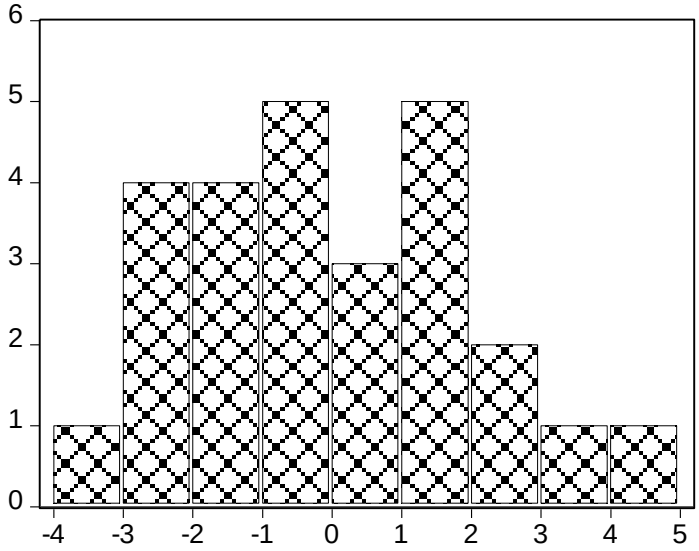
Gross domestic product (GDP), an indicator of economic growth, and inflation rate (INF CPI), have a positive relationship. It means that, while holding all other variables, a unit increase in consumer prices (INF CPI) of one percent will lead in a correlating increase in economic growth of 6.58%. As tcal (0.4664) is less than ttab, there is no statistically significant relationship between the two (2.101). We fail to reject the null hypothesis and come to the conclusion that the estimate inflation, consumer prices, is statistically unimportant at the 5% level of significance using the t test criterion of the long run equation for model (that is, tcal (0.4664) is smaller than ttab (2.101) @ DF 28). This suggests that consumer price increases and inflation have little impact on Uganda's gross domestic output.

The Jarque-Bera Normality test

The normality of the residuals is tested to use the Jarque-Bera (1987) test. The test's null hypothesis is that the residual is multivariate uniformly distributed. Since the null hypothesis has been rejected, it follows that the residuals are not normally distributed. The Jarque-Bera test is used in this study, and the findings are shown in the table below.

The Jarque-Bera test is used in this study, and the findings are shown in the table below.

Ha: Residuals are not normally distributed



Series: Residuals	
Sample 1994 2019	
Observations 26	
Mean	2.05E-16
Median	-0.425009
Maximum	4.335576
Minimum	-3.461930
Std. Dev.	2.019142
Skewness	0.298379
Kurtosis	2.415150
Jarque-Bera	0.756352
Probability	0.685110

Figure 1: The Jarque-Bera Normality test

Basing on P-value in figure 1 above, since Jarque-Bera p-values are greater than 0.05, then we fail to reject the null hypothesis that the residuals are multivariate normal at 5 percent level of significance. This implies that the model estimated is correctly specified.

Conclusion

It is found in the current study that all variables; GDP per capita growth, foreign direct investment and inflation (consumer prices) turned out to be non-stationary at their levels but became stationary at their first difference while real effective exchange rate turned to be stationary at levels. After testing for cointegration using Johansen approach, the trace statistics test indicates that there exist a long run and short run relationship between growth in real GDP per capita, foreign direct investment, inflation (consumer prices) and real effective exchange rates in Uganda.

According to the study, real effective exchange rates had a favorable long-term impact on the growth of real GDP per capita. As a result, a rise in the real effective exchange rate improves the growth of the real GDP per capita. The rise of real GDP per capita, however, was negatively affected by both foreign direct investment and the rate of inflation (consumer prices). Therefore, a decrease in these factors will result in an improvement in the increase of real GDP per capita. Therefore, in the long run, real effective exchange rate is a substantial determinant of growth in real GDP per capita in Uganda, while foreign direct investment and inflation (consumer prices) are unimportant determinants. However, there is 28.17 in the foreseeable term.

Recommendations

Trade Liberalization Policy

Results show that FDI inflows generate economic growth in Uganda. It is therefore recommendable that the government of Uganda continues to attract more international capital inflow through both direct and indirect investments if it is to achieve its growth target of 8 percent growth rate per annum. However as seen earlier in Chapter two; most of the inward FDIs to Uganda are concentrated mainly in the manufacturing and service sector and yet agricultural sector remains the backbone of Uganda's economy. There is no doubt that this growth is emerging mainly from the manufacturing and service sector of the economy, with the rest of the sectors contributing very little or negatively to economic growth; eventually the overall growth effects in the economy remains insignificant and sluggish. The Government of Uganda through UIA should therefore embark on sectorial allocation of FDIs with more FDIs directed to sectors such as agriculture with greater multiplier effects in generating economic growth. Increasing foreign direct investments should be directed into strategic areas of the economy like energy, oil and gas, transportation and information and communication technology to increase economic growth; and in setting up export promotion industries to increase the value of exports thus realizing high foreign exchange earnings to stimulate more economic growth.

Exchange rate policy

The research and results indicate a negative relationship between local currency appreciation and long-term economic growth. The results, then, offer econometric confirmation for the structural approach, which argues that a rise in exchange rates results in a decline in economic output. As a result, it is wrong to think that Uganda, which has a production structure based on imported inputs, experiences export-led growth as a result of local currency depreciation. The main policy implication from the findings is that an exchange rate policy framework is required to support Uganda's current inflation targeting system. In the framework of the inflation targeting technique employed, officials in Uganda must prevent the upside by not entirely liberalizing the currency rate.

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