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Original Article

Determinants of Economic Growth in Uganda (2010-2023)

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ABSTRACT

The study will examine the determinants of economic growth in Uganda. Specifically, to examine the effect of Foreign Direct Investment on economic growth, to examine the effect of population growth on economic growth, and to examine the effect of foreign aid on economic growth in Uganda. The study will use a time series design since it focuses on a single entity, unlike panel data. It focused on understanding the impact of Foreign Direct Investment (FDI), population growth, and foreign aid on Uganda's economic growth over time. The data was processed and analysed using the E-views statistical package. This model is suitable for analysing single-variable time series data. The VAR model will help quantify the interdependencies between industrial sector growth and its determinants, allowing us to explore dynamic relationships. ARDL models were useful when examining both short-term and long-term relationships between industrial sector growth and its determinants, especially when the variables are of different orders of integration. The study was conducted in a way that all information provided by the various bodies was handled with due confidentiality. The researcher obtained an introductory letter from BSU REC and the Bank of Uganda to secure approval to conduct the study before data collection commenced. To maintain confidentiality and privacy, information obtained was kept confidential and accessible. The study concluded that there is a strong positive relationship between population growth and economic growth (r = 0.7751). However, the relationships between economic growth and the other two variables, FDI (r = 0.01171) and foreign aid (r = 0.09076), are very weak, suggesting minimal direct linear association in the dataset. The study further concluded that 95% of the variation in economic growth is explained by the three independent variables combined. The study recommends that strengthening regulatory oversight and promoting partnerships that build local capacity can help maximise the developmental impact of foreign investment. Authorities should improve planning, transparency, and monitoring systems to ensure aid is channelled into priority sectors such as infrastructure, education, and health. Implementing results-based frameworks and involving local stakeholders in aid program design can increase efficiency and foster sustainable outcomes. The study further recommends that the government should adopt a balanced approach

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by investing in human capital development, particularly education, skills training, and healthcare, to transform population growth into a demographic dividend.

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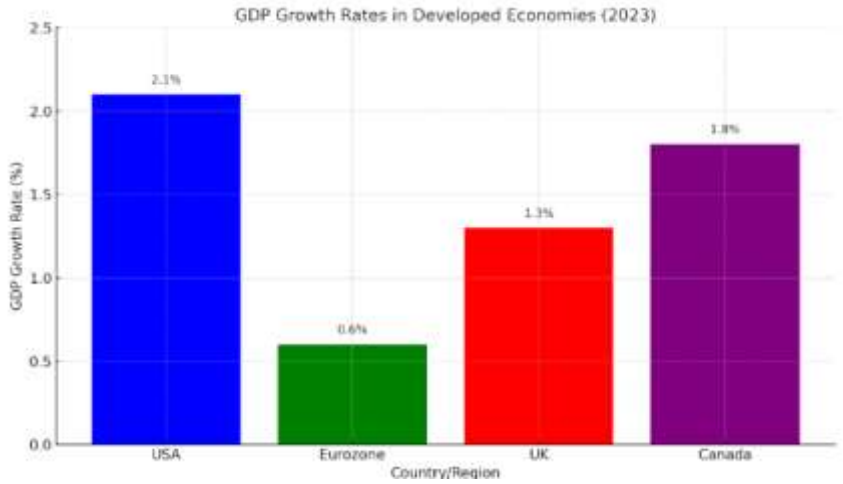
INTRODUCTION

Globally, economic growth in developed countries is generally characterised by higher per capita incomes, advanced technological capabilities, efficient infrastructure, and strong institutions. These nations often have diversified economies with significant contributions from the services, manufacturing, and technological sectors. The U.S. economy has experienced moderate growth in recent years. After the 2008 financial crisis, the economy rebounded but at a slower pace. In 2023, the U.S. GDP growth rate was estimated at **2.1%** according to the Bureau of Economic Analysis (U.S. Bureau of Economic Analysis, 2023). The Eurozone has faced slower growth in recent years due to structural challenges, political instability, and demographic changes. In 2023, the EU's GDP growth was estimated at **0.6%** (Eurostat, 2023). The EU is highly integrated, but individual member states have varying growth rates. The UK economy has faced challenges, particularly in the aftermath of Brexit. In 2023, the UK's GDP growth was **1.3%** (Office for National Statistics, 2023). Canada has experienced relatively stable growth in recent years, with a GDP growth rate of **1.8%** in 2023 (Statistics Canada, 2023).

Figure 1: Uganda's Real Growth Trends



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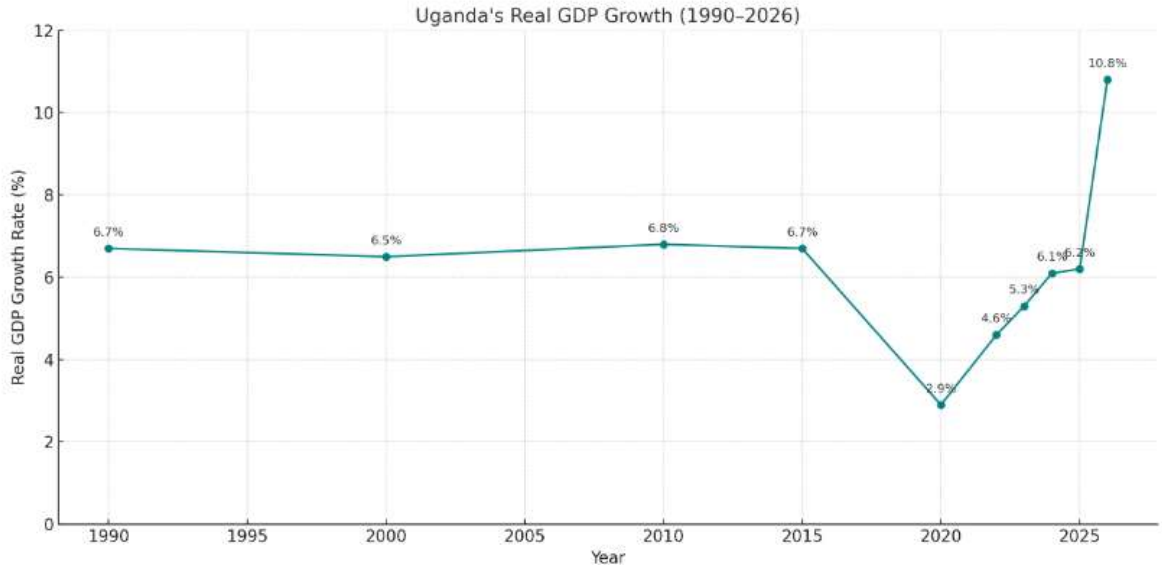
The United States had the highest growth at 2.1%, followed by Canada at 1.8%, the UK at 1.3%, and the Eurozone at 0.6%.

Economic Growth in Uganda.

Upon gaining independence in 1962, Uganda's economy grew rapidly. Real GDP expanded by about 6.7 % annually during the first five years, even with population growth of roughly 2.5 %, indicating real per capita gains exceeding 4 % per year. Growth during this era was almost entirely driven by agriculture, with industrial activity like food processing contributing nearly 9 % of GDP by the late 1960s. However, political turmoil and economic mismanagement during the 1970s under Idi Amin and the second Obote regime caused a deep economic decline, with GDP per capita contracting sharply and destabilising the economy (World Bank, 2024).

From 1990 onward, Uganda embarked on structural reforms, liberalisation and received significant donor support. Between 1990 and 2015, real GDP grew at an average annual rate of 6.7 %**,** while real per capita GDP grew at approximately 3.3 % per year (World Bank, 2021). Over this period, the structure of the economy shifted markedly: agriculture's share of GDP declined from about 56 % to 24 %, industry grew from 11 % to 20 %, and services rose from 32 % to 55 % of economic output. This structural transformation reflected growing diversification beyond traditional agriculture into manufacturing, construction, and services.

Figure 2: Uganda's Real GDP Growth



The line graph illustrates Uganda's real GDP growth from 1990 to the projected growth in 2026. From 1990 through 2015, the country experienced consistently strong growth, averaging around 6.7% annually due to structural reforms and economic liberalisation. A sharp dip is seen in 2020 due to the COVID-19 pandemic, with growth dropping to around 2.9%. However, the economy rebounded steadily, reaching 6.1% in 2024. The most notable feature is the projected spike to **10.8% in 2026**, driven by anticipated oil production and major infrastructure investments like the East African Crude Oil Pipeline.

Problem Statement

Economic growth is a fundamental aspect of national development, and examining the determinants that drive or hinder growth can offer invaluable insights for policy formulation, business development, and overall societal welfare (Adanma

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& Ogunbiyi, 2024). In a bid to improve economic growth, the government has invested in critical infrastructure such as roads, energy, water supply, telecommunications, and public transport. Improved infrastructure facilitates trade, reduces transaction costs, and enhances productivity, thereby stimulating economic growth. The Government has also signed trade agreements, reducing trade barriers and improving access to global markets for domestic products (Olubandwa, 2022).

Despite the Government's efforts, Uganda's economic growth is impacted by external factors such as global oil prices, international trade policies, and foreign direct investment (FDI). In recent years, Uganda has seen a decline in FDI inflows, from $1.4 billion in 2018 to $1.1 billion in 2020 (UNCTAD, 2021). According to the World Bank (2023), Uganda's GDP growth rate was 6.1% in 2022, down from a pre-pandemic average of 7-8% annually. Foreign aid in 2019 accounted for approximately 8.4% of Uganda's GDP but declined to about 6.2% of GDP in 2021, reflecting a reduction in overall aid flows (UBOS, 2020). Uganda's population is growing at 3.3% annually, which presents both opportunities for a larger market and workforce, but also challenges in providing adequate infrastructure and services to meet the demands of a growing population (UBOS, 2021). This decline highlights the vulnerability of the Ugandan economy to both global and domestic challenges, including political instability, fluctuating global commodity prices, and climate-induced shocks. The Uganda Bureau of Statistics (2021) reported that Uganda's GDP per capita stands at approximately $888 (nominal), which reflects the nation's continued struggle with poverty and growing population growth rate. The benefits of this growth are unevenly distributed, with poverty remaining high, especially in rural areas, where approximately 27% of the population lives below the national poverty line (World Bank, 2020).

Purpose of the Study

The purpose of the study was to examine the determinants of economic growth in Uganda. The study aimed to identify the most influential drivers of growth over time, assess their relative impact, and provide policy-relevant insights to support sustainable economic development in the country.

Specific Objectives

- To examine the effect of Foreign Direct Investment on economic growth in Uganda.
- To examine the effect of population growth on economic growth in Uganda.
- To examine the effect of foreign aid on economic growth in Uganda.

Research Hypothesis

H0:	Foreign Direct Investment has no significant effect on economic growth in Uganda.
H1:	Foreign Direct Investment has a significant effect on economic growth in Uganda.
H0:	Population growth has no significant effect on economic growth in Uganda.
H1:	Population growth has a significant effect on economic growth in Uganda.
H0:	Foreign aid has no significant effect on economic growth in Uganda.
H1:	Foreign aid has a significant effect on economic growth in Uganda.

METHODOLOGY

The study employed a panel data research design, which captures both temporal and cross-sectional variations to better estimate the effects of foreign direct investment (FDI), population growth, and foreign aid on Uganda's economic growth, while controlling for unobserved heterogeneity. Guided by the Solow-Swan Growth Model, which

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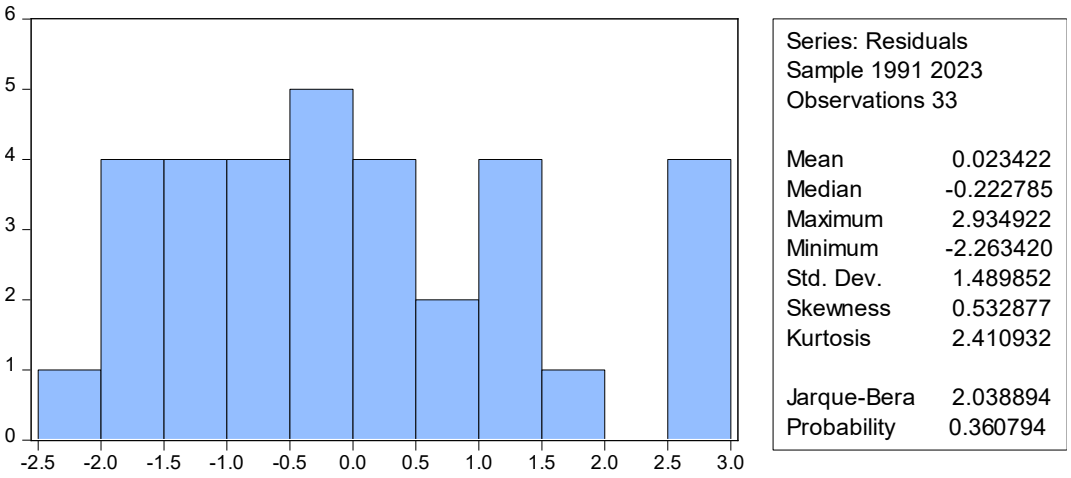
emphasises capital, labour, human capital, and technological progress, the study applied rigorous estimation procedures, including data transformation, stationarity and cointegration tests, and OLS regression with robust standard errors to ensure reliable results. Hypotheses on the significance of FDI, population growth, and foreign aid were tested using t-tests, supported by diagnostic checks for multicollinearity, autocorrelation, and heteroscedasticity. Data analysis combined descriptive statistics, Pearson's correlation, and multiple regression techniques**,** with data sourced primarily from UBOS and the World Bank's World Development Indicators**.** Ethical standards were upheld through formal approval from BSU-REC and the Bank of Uganda, ensuring informed consent, confidentiality, voluntary participation, data security, and strict compliance with institutional and national research guidelines, thereby safeguarding participants' rights while producing policy-relevant findings.

RESEARCH FINDINGS

Normality Test

The data consisted of 33 annual observations spanning the years 2010 to 2023**.** The normality test was conducted to evaluate the distribution of residuals and to confirm that the model meets the assumptions necessary for valid regression analysis. Descriptive statistics and visual inspection were used to assess the degree to which the residuals approximate a normal distribution, which is critical for ensuring the robustness and reliability of the model's results.

Figure 3: Normality Test of Regression Residual



The data had observations from the year 2010 to 2023 with 33 observations. The Mean was 0.023422, indicating that the average of the residuals is very close to zero, which is an important property for a well-specified linear regression model with an intercept, indicating that the model is unbiased on average. The Median was -0.222785, indicating that the median is slightly negative, which aligns with the visual observation of a slight positive skew. The maximum, which was the largest positive residual value, was 2.934922. Minimum: which was the largest negative residual value, was -2.263420.

The standard deviation of the residuals was 1.489852, indicating more spread-out errors. Skewness was 0.532877, indicating a moderate degree of positive skew. Kurtosis was 2.410932, indicating the distribution is platykurtic, meaning it has lighter tails and a flatter peak than a normal distribution. Jarque-Bera was 2.038894.

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After concluding that the residuals had a mean close to zero, moderate skewness, and no strong departure from normality (as supported by the Jarque-Bera statistic), the researcher proceeded with further model diagnostics to validate the regression assumptions. Specifically, the researcher tested for **heteroskedasticity** to confirm constant error variance, examined **autocorrelation** to check independence of residuals, and assessed multicollinearity among the explanatory variables to ensure stable coefficient estimates. Once these diagnostic checks supported the reliability of the model, the researcher moved on to interpret the regression coefficients, conduct hypothesis testing, and evaluate the overall goodness-of-fit to draw meaningful inferences from the data.

Heteroskedasticity Test: Breusch-Pagan-Godfrey

This study employed the **Breusch-Pagan-Godfrey (BPG) test** to examine the presence of heteroskedasticity in the residuals of the regression model. The BPG test evaluates whether the variance of residuals is systematically related to the independent variables. By analysing the F-statistic, Chi-Square statistic, and their corresponding probabilities, the test helps determine whether the null hypothesis of homoskedasticity can be rejected as follows;

Null Hypothesis (H_0): Homoskedasticity (constant variance of residuals).

Alternative Hypothesis (H_1): Heteroskedasticity (non-constant variance of residuals).

Table 1: Breusch-Pagan-Godfrey Heteroskedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	7.257943	Prob. F(4,3)		0.0676
Obs*R-squared	7.250744	Prob. Chi-Square(4)		0.1232
Scaled explained SS	0.821251	Prob. Chi-Square(4)		0.9356
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.042267	0.036406	1.160977	0.3296
Population_Growth_	-0.015031	0.009139	-1.644709	0.1986
Foreign_Direct_Investment	-0.001468	0.000303	-4.845456	0.0168
Foreign Aid	0.000433	0.000327	1.326107	0.2767
R-squared	0.906343	Mean dependent var		0.006783
Adjusted R-squared	0.781467	S.D. dependent var		0.006903
S.E. of regression	0.003227	Akaike info criterion		-8.365421
Sum squared resid	3.12E-05	Schwarz criterion		-8.315770
Log likelihood	38.46168	Hannan-Quinn criter.		-8.700297
F-statistic	7.257943	Durbin-Watson stat		1.537041
Prob(F-statistic)	0.067629			

Table 1 shows that the p-value (0.0676) is greater than 0.05 at the 5% significance level, so we fail to reject the null hypothesis of homoskedasticity. This implies that there is no statistically significant evidence of heteroskedasticity based on the F-statistic. The Observed R-squared value was 7.250744. The p-value of the Observed R-squared value was (0.1232), greater than 0.05. Therefore, at 5% significance level, we fail to reject the null hypothesis of homoskedasticity, which implies that there is no statistically significant evidence of heteroskedasticity based on this test statistic. The scaled explained Sum of Square value was 0.821251, and the probability of the Chi-Square value was 0.9356, hence we fail to reject the null hypothesis of homoskedasticity, implying the presence of homoskedasticity.

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After concluding that there was no statistically significant evidence of heteroskedasticity (hence the residuals are homoskedastic), the researcher proceeded with further regression analysis under the assumption of constant variance of errors, which validates the use of parametric inference techniques such as ordinary least squares (OLS) estimates, t-tests, and F-tests without the need for heteroskedasticity-robust adjustments. This allowed the researcher to reliably interpret the estimated coefficients, assess their significance, and draw inferences about the relationships in the model.

Autocorrelation Analysis

To assess whether autocorrelation is present in the residuals, this study employed the Breusch-Godfrey (BG) Serial Correlation LM Test**.** Unlike simpler tests such as the Durbin-Watson statistic, the BG test allows for higher-order serial correlation and is suitable when the model includes lagged dependent variables or multiple regressors. The test evaluates the null hypothesis that there is no serial correlation up to a specified lag order against the alternative that autocorrelation exists. Applying the Breusch-Godfrey test is particularly important in this study because the data span multiple years (2010–2023), and time-series properties could induce correlation among residuals. By confirming the absence of serial correlation, the study ensures that the model estimates are consistent, reliable, and suitable for statistical inference.

Null Hypothesis (H_0): There is no serial correlation up to the specified lags (in this case, 2 lags, as seen from RESID(-1) and RESID(-2) in the test equation).

Alternative Hypothesis (H_1): There is serial correlation.

Table 2: Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	0.073871	Prob. F(2,26)		0.9290
Obs*R-squared	0.186459	Prob. Chi-Square(2)		0.9110
Variable	Coefficient	Std. Error	t-Statistic	Prob.
POPULATION_GROWTH_	-0.006304	0.126395	-0.049878	0.9606
FOREIGN_DIRECT_INVESTMENT	-0.000161	0.015993	-0.010068	0.9920
FOREIGN _AID	-4.20E-11	5.52E-10	-0.076205	0.9398
RESID(-1)	-0.049379	0.203264	-0.242932	0.8100
RESID(-2)	0.069780	0.245629	0.284088	0.7786
R-squared	0.005397	Mean dependent var		0.023422
Adjusted R-squared	-0.224127	S.D. dependent var		1.489852
S.E. of regression	1.648376	Akaike info criterion		4.023290
Sum squared resid	70.64575	Schwarz criterion		4.340731
Log likelihood	-59.38428	Hannan-Quinn criter.		4.130099
Durbin-Watson stat	2.000774			

Table 2 shows that the p-value (0.9290) is much greater than the 0.05 level of significance, and hence we fail to reject the null hypothesis. This indicates no statistically significant evidence of serial correlation in the residuals up to 2 lags based on the F-statistic. The probability of the Chi-Square (2) value was 0.9110, greater than the 0.05 level of significance. Therefore, we fail to reject the null hypothesis of no serial correlation based on this Chi-Square statistic.

After concluding that there was no statistically significant evidence of serial correlation in the residuals, the researcher proceeded with further diagnostic checks to strengthen the validity of the regression model. Since the absence of serial

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correlation confirmed that the residuals were independent across time, the researcher was able to proceed confidently with the interpretation of regression coefficients, hypothesis testing, and the evaluation of model fit without the need for corrective measures such as generalised least squares (GLS) or Newey–West standard errors.

Data Analysis

The data analysis was carried out in three main stages to ensure a comprehensive examination and validation of the dataset. First, descriptive statistics were computed to summarise key features, including measures of central tendency (mean, median), dispersion (standard deviation, range), and the overall distribution of variables, providing a foundational understanding of the data and highlighting any anomalies or outliers that could affect further analysis. Second, correlation analysis was performed to assess the strength and direction of relationships among the variables, which is critical for detecting potential multicollinearity, guiding model specification, and interpreting how independent variables jointly influence the dependent variable. Finally, regression analysis was conducted to model the relationships between the dependent variable and multiple independent variables, allowing for quantification of their magnitude and direction, hypothesis testing, and prediction.

Descriptive Statistics

This section presents the results of descriptive statistical analysis conducted to summarise the key characteristics of the study variables. The analysis includes the mean, standard deviation, skewness, kurtosis, and the Jarque-Bera test for normality. These statistics help in understanding the central tendency, dispersion, and distributional properties of economic growth, population growth, foreign direct investment, and foreign aid over the study period. The results serve as a foundation for further econometric analysis and model validation.

Table 3: Descriptive Statistics of Study Variables (2010–2023)

	ECONOMIC GROWTH	POPULATION_GROWTH	FOREIGN DIRECT INVESTMENT	FOREIGN AID
Mean	6.358964	3.053178	76.32538	7.216431
Std. Dev.	0.626964	0.236880	5.461205	9.910765
Skewness	0.421924	-0.048412	-0.059697	1.624881
Kurtosis	2.012869	2.431486	2.446065	6.393456
Jarque-Bera	2.318947	0.582020	0.107033	38.63387
Probability	0.313651	0.747508	0.947890	0.000000

The results in Table 3 show that the Mean and Median for Economic growth were 6.36 and 6.29, respectively, suggesting a relatively symmetrical distribution. Range (Min 5.60 to Max 7.75), indicating that the growth rates are quite concentrated, indicating a consistent performance within this range. The Standard Deviation was 0.63, indicating a relatively small standard deviation, confirming that the data points are closely clustered around the mean. The Skewness was 0.42, slightly positively skewed, indicating a slightly longer tail towards higher growth rates, but it's close to symmetrical. The kurtosis was 2.01, less than 3, indicating a platykurtic distribution, meaning lighter tails and fewer extreme values than a normal distribution. The Probability of the Jarque-Bera was 0.31, greater than 0.05, hence accept the null hypothesis that Economic growth is normally distributed.

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The Mean 3.05 and Median 3.00 for population growth were very close, indicating a symmetrical distribution. The range (Min 2.48 to Max 3.49) for population growth was tightly clustered, while its Standard Deviation was 0.24**,** which is a very low standard deviation, implying very little variability in population growth rates. Its skewness was -0.05, very close to zero, indicating a highly symmetrical distribution. Its kurtosis was 2.43, also platykurtic, suggesting fewer extreme population growth rates. The probability of the Jarque-Bera was 0.75, greater than 0.05, strongly indicating that population growth is normally distributed.

The Mean 76.33 and Median 75.97 for investment in education were very close, indicating a symmetrical distribution. The range (Min 67.17 to Max 84.79), indicating a decent range in foreign Direct investment. The Standard Deviation was 5.46, indicating a moderate standard deviation given the range, indicating some variability. Skewness was -0.06, **v**ery close to zero, suggesting a symmetrical distribution. Kurtosis was 2.45, hence Platykurtic, indicating fewer extreme values. The probability of the Jarque-Bera was 0.95, greater than 0.05, indicating that investment in education is normally distributed.

The Mean 7.22 and Median 5.55 for foreign Aid indicate a positive skew and the presence of some higher values pulling the mean up. The range was (Min -6.99 to Max 41.96), and **t**his indicated a very wide range, including negative values, which is significant. The maximum value, 41.96, was an extreme outlier compared to the median. The standard deviation was 9.91, which was very high, indicating substantial variability and dispersion in gross capital formation. Skewness was 1.62, indicating high positive skewness, thus confirming that there are some very high values (outliers) pulling the distribution's tail to the right. Kurtosis was 6.39, hence leptokurtic, indicating heavy tails and a sharper peak than a normal distribution, meaning there are more extreme values (outliers) present.

The probability of the Jarque-Bera was 0 less than 0.05, hence we strongly reject the null hypothesis that gross capital formation is normally distributed. Hence, its distribution was not normal due to high skewness and kurtosis, likely driven by the extreme maximum value and the negative minimum.

Correlation Analysis

This section provides the results of the Pearson correlation coefficient analysis conducted to examine the strength and direction of the linear relationships between the study variables: economic growth, population growth, foreign direct investment, and foreign aid. The Pearson correlation was applied because the variables are continuous and normally distributed. The correlation coefficients range between -1 and +1, where values close to +1 indicate a strong positive relationship, values near -1 indicate a strong negative relationship, and values around 0 suggest no linear association. This analysis helps identify potential multicollinearity issues and guides the selection of variables for further regression analysis. Borders have been removed for clarity and to present the matrix in a cleaner, more readable format.

Table 4: Correlation Matrix of Study Variables

	Economic Growth	Population Growth	Foreign Direct Investment	Foreign Aid
Economic Growth	1	0.7751	0.01171	0.09076
Population Growth	0.7751	1	0.017698	-0.17017
Foreign Direct Investment	0.01171	0.01769	1	0.5686
Foreign Aid	0.09076	-0.1701	0.5686	1

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The results presented in Table 4 provide an initial assessment of the relationships between economic growth and the key explanatory variables, population growth, foreign direct investment (FDI), and foreign aid, using the Pearson correlation coefficient. The correlation between economic growth and population growth was 0.7751, indicating a strong positive association. This suggests that, in general, periods of higher population growth are associated with higher economic growth, while slower population growth tends to coincide with reduced economic growth.

In contrast, the correlation between economic growth and foreign direct investment was 0.01171, indicating a very weak positive relationship. Similarly, the correlation between economic growth and foreign aid was 0.09076, also reflecting a very weak positive association. These low correlation values suggest that, while there may be some relationship, the linear association between economic growth and these variables is minimal when considered in isolation.

While correlation analysis provides insight into the direction and strength of linear relationships, it does not account for the simultaneous influence of multiple explanatory variables on economic growth. To address this, regression analysis was conducted to quantify the effect of each independent variable while controlling for the others. This approach allows for a more rigorous assessment of how population growth, foreign direct investment, and foreign aid individually and collectively influence economic growth, enabling hypothesis testing and identification of statistically significant determinants.

Regression Analysis Introduction, Based on Results, How Estimation was Done, Tell whether it is Significant.

This section presents the regression analysis results used to estimate the effects of population growth, foreign direct investment, and foreign aid on economic growth. The estimation was carried out using the Ordinary Least Squares (OLS) method, which minimises the sum of squared residuals to obtain the best-fitting linear relationship.

Table 5: Regression Results of Determinants of Economic Growth in Uganda (2010–2023

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Population Growth	0.162250	0.299190	0.542296	0.6164
Foreign Direct Investment	-0.036583	0.010863	-3.367540	0.0281
Foreign Aid	0.045838	0.011732	3.906981	0.0174
R-squared	0.948388	Mean dependent var		6.907884
Adjusted R-squared	0.909679	S.D. dependent var		0.387562
S.E. of regression	0.116475	Akaike info criterion		-1.155420
Sum squared resid	0.054266	Schwarz criterion		-1.115699
Log likelihood	8.621679	Hannan-Quinn criter.		-1.423320
Durbin-Watson stat	2.00			

Estimation Equation:

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ECONOMIC GROWTH _ = C (1)*POPULATION_GROWTH + C(2)* FOREIGN DIRECT INVESTMENT + C(3)*FOREIGN AID.

Substituted Coefficients:

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ECONOMIC GROWTH = 0.162250*POPULATION_GROWTH - 0.036583* FOREIGN DIRECT INVESTMENT + 0.04583* FOREIGN AID.

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For population growth, the coefficient of 0.162250 suggests that, holding other factors constant, a one-unit increase in population growth (1 percentage point) is associated with an estimated 0.162250-unit increase in economic growth. However, the p-value of 0.6164 exceeds the conventional 5% significance level, indicating that this effect is not statistically significant. This implies that, within this model, population growth does not have a reliably measurable impact on economic growth.

For Foreign Direct Investment, the coefficient of -0.036583 indicates that, controlling for other variables, a one-unit increase in FDI is associated with a slight decrease of 0.036583 units in economic growth. The p-value of 0.0281 is less than 0.05, demonstrating that FDI has a statistically significant effect on economic growth at the 5% significance level. This finding may reflect context-specific dynamics in which foreign investment does not always translate immediately into measurable growth, possibly due to structural or absorptive capacity constraints.

For Foreign Aid, the coefficient of 0.045838 shows that, ceteris paribus, a one-unit increase in foreign aid is associated with an estimated 0.045838-unit increase in economic growth. The p-value of 0.0174 confirms that this effect is statistically significant at the 5% level, suggesting that foreign aid contributes positively and reliably to economic growth in this context.

Overall, these results indicate that while foreign direct investment and foreign aid are significant determinants of economic growth, population growth does not show a statistically meaningful influence within this model. This highlights the varying roles of different macroeconomic factors in driving growth and suggests that policy measures may need to focus more on optimising foreign capital inflows and effective aid utilisation rather than relying solely on demographic expansion.

DISCUSSION

Effect of Foreign Direct Investment on Economic Growth

The study found that FDI (r = 0.01171) is very weak, suggesting minimal direct linear association in the dataset. Still. Foreign direct investment has a statistically significant negative effect on economic growth (coefficient = -0.036583, p = 0.0281), suggesting that increases in FDI, under current conditions, may be associated with slower economic expansion, possibly due to repatriation of profits or poorly structured investment agreements.

This is not in agreement with Ibrahim et al (2019), who found a positive relationship between FDI inflows and GDP in the long-run and short-run. The results are also in agreement with Sokang (2018), who asserts that there is a positive and statistically significant impact of FDI on export in the long run. The results are also in agreement with Akinwale et al (2018), who explored that macroeconomic variables have a positive and significant impact on FDI inflows in Nigeria, while the inflation rate discourages FDI inflows in the country. The results are also in line with Ullah and Khan (2017), who found that real GDP, domestic investment, and economic freedom index have a positive and significant effect on FDI inflows in the Asian region, while governance index and labour force have a negative impact on FDI inflows. The results are also in line with Reza et al (2018), who found that there is a positive and statistically significant impact of FDI on export in the long run.

Effect of Population Growth on Economic Growth

The results show that the correlation between Economic growth and population growth was 0.7751, indicating a strong positive correlation between Economic growth and population growth, meaning that as population growth increases, Economic growth tends to increase, and as population growth decreases, Economic growth tends to decrease. It is noted that for every one-unit

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increase in population growth (1 percentage point), Economic growth is estimated to increase by 0.162250 units, holding other variables constant. The p-value, 0.6164, is greater than 0.05. Therefore, population growth is not statistically significant in explaining Economic growth in this model, at conventional significance levels.

The results are in agreement with Furuoka (2010), who examined the effect of population growth on economic development in the Philippines for the period of 1950-2007, and found a long-run equilibrium relationship between economic performance and population growth. Besides, a one-way causality running from economic development to population growth was determined. It was noted that the results are in line with Ali et al. (2013), who noted that it was negatively affected by the employment rate. Thuku et al. (2013) also examined the economic growth and population growth nexus in Kenya for the period 1963-2009, and found that population growth and economic growth are both positively correlated. Besides, an increase in population will have a positive impact on the economic growth in the country. Abdullah et al. (2015) assert that economic growth and population are both negatively correlated, and an increase in population will affect economic growth negatively. Degu (2019) asserts that population growth has a negative and important impact on economic growth, both in the short-run and in the long-run. Konat and Fendogdu (2021) investigated the relationship between population growth and the development of BRICS-T countries by employing panel data analysis.

Effect of Foreign Aid on Economic Growth

The results show that foreign aid (r = 0.09076) is very weak, suggesting minimal direct linear association in the dataset. Foreign aid demonstrates a positive and statistically significant impact on economic growth (coefficient = 0.045838, p = 0.0174), implying that aid, when properly utilised, can contribute to productive economic outcomes.

The results are not in line with Babalola and Shittu (2020), who noted that foreign aid reduced the negative effect of foreign aid on economic growth. Finally, it is deduced that trade openness has a positive effect, but government size has a negative effect on economic growth. Feeny (2005) noted that a long-run relationship between foreign aid and economic growth is concluded. And a unidirectional causality is also found, running from foreign aid to economic growth. Kargbo (2012) revealed that foreign aid was effective in a pre- and post-war era, and its marginal effectiveness was more in the pre-war period compared to the post-war period. Abd el Hamid Ali (2013) found that foreign aid has a significant short and long-run negative relationship with economic growth.

CONCLUSION

The correlation and regression analyses provide insightful findings regarding the relationship between economic growth and its key determinants: population growth, foreign direct investment (FDI), and foreign aid. The correlation matrix shows a strong positive relationship between population growth and economic growth (r = 0.7751), indicating that these variables tend to move in the same direction. However, the relationships between economic growth and the other two variables, FDI (r = 0.01171) and foreign aid (r = 0.09076), are very weak, suggesting minimal direct linear association in the dataset. While correlation alone does not imply causality, it sets the stage for deeper examination through regression analysis.

The regression results, estimated using the Ordinary Least Squares (OLS) method, indicate that foreign direct investment and foreign aid are statistically significant predictors of economic growth, while population growth is not. Specifically, foreign direct investment has a statistically significant negative effect on economic growth (coefficient = -0.036583, p = 0.0281), suggesting that increases in FDI, under current conditions, may be associated with slower economic expansion, possibly due to repatriation of profits or poorly structured

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investment agreements. Conversely, foreign aid demonstrates a positive and statistically significant impact on economic growth (coefficient = 0.045838, p = 0.0174), implying that aid, when properly utilised, can contribute to productive economic outcomes. Population growth, despite its strong correlation with economic growth, is not statistically significant in the regression model (p = 0.6164), suggesting its effect may be mediated through other variables or overshadowed by structural economic factors.

Overall, the model is robust, with an R-squared value of 0.948388, indicating that approximately 95% of the variation in economic growth is explained by the three independent variables combined. This high explanatory power lends credibility to the model's predictions. However, the findings also point to the need for policy refinement. Policymakers should critically evaluate the structure and terms of foreign direct investment to ensure it contributes positively to the economy. Simultaneously, the effective utilisation of foreign aid should be emphasised, and further investigation into the indirect channels through which population growth might affect the economy is warranted.

Recommendations

Strengthen the Governance and Structuring of Foreign Direct Investment (FDI): Given the statistically significant negative impact of FDI on economic growth in the current model, the government should revisit existing FDI policies to ensure that investments are well-aligned with national development goals. This includes renegotiating investment terms to limit profit repatriation, enforcing technology transfer requirements, and prioritising sectors with high domestic value addition. Additionally, strengthening regulatory oversight and promoting partnerships that build local capacity can help maximise the developmental impact of foreign investment.

Enhance the Efficiency and Accountability in the Use of Foreign Aid: Since foreign aid was found to have a positive and significant effect on economic growth, there is a strong case for optimising its utilisation. Authorities should improve planning, transparency, and monitoring systems to ensure aid is channelled into priority sectors such as infrastructure, education, and health. Implementing results-based frameworks and involving local stakeholders in aid program design can increase efficiency and foster sustainable outcomes. Furthermore, reducing aid dependency by progressively building local resource mobilisation capacities is crucial.

Reevaluate Population Policy in Relation to Economic Planning: Although population growth showed a strong positive correlation with economic growth, its lack of statistical significance in the regression model suggests the relationship is complex. The government should adopt a balanced approach by investing in human capital development, particularly education, skills training, and healthcare, to transform population growth into a demographic dividend. Integrating population dynamics into national economic planning can also help ensure that the labour force is equipped to meet the demands of an evolving economy.

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