

## **International Trade and Economic Growth Nexus. Empirical Evidence from Uganda**



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**ABSTRACT:** Exports, imports, and foreign direct investment were used as proxies in this study to examine the relationship between global trade and economic growth in Uganda from 1988 to 2018. Exports, imports, and foreign direct investment all strongly positively and significantly correlated with economic growth, according to empirical evidence.

Unit root tests were performed using the Augmented Dickey Fuller test, and the results showed that all variables started out non-stationary but subsequently became constant. Due of the long-term correlations between the variables, cointegration was established using the Engle Granger Cointegration test. The variables' rate of adaptation to the long run within a one-year lag was 57%. Collectively, foreign investment, imports, and exports contribute for 77% of changes in the country's GDP. 23% of the variations in the growing size of the economy were caused by extra factors in the error term that were not included in the model. Because the F statistic was considered statistically significant, exports, imports, and foreign direct investment all have a significant impact on economic growth in the short run. For the sake of making policy suggestions, it is encouraged to use export marketing strategies to grow Uganda's exports and to give domestic businesses tax breaks to improve the way they perform. A welcoming investment atmosphere must also be provided for Uganda to attract foreign direct investment.

**KEY WORDS:** exports, imports and foreign direct investment

### **BACKGROUND TO THE STUDY**

Economic development must be the primary objective of any country. As a result, many countries engage in international trade, which aids in their steady GNP growth. International commerce, which consists of exports and imports, is carried out by countries on a global scale and greatly advances economic development. Exports are crucial because they push local businesses to develop new products and services in order to gain a substantial market share and make a profit (Annet et al., 2023). Exporters also aid in the expansion of the world economy by giving exporting companies access to international markets and enabling them to realize economies of scale (Henry & Wilfred, 2015). On the other hand, investment product imports promote economic expansion by increasing the efficiency and productivity of domestic businesses. In the long run, this leads to better rates of economic expansion and financial success, but imports also force local currency out of the country, widening the trade deficit since imports are exorbitantly purchased at the expense of exporters (Ghaffar et al., 2019).

It is unquestionably true that international trade has a significant impact on a nation's economic expansion and advancement by expanding its domestic marketplace and thus boosting worldwide production as well as by allowing countries to consume goods beyond their production capability frontiers through internal as well as external economies of scale. It is viewed as a growth engine by both classical and neoclassical economists (Christopher & Felex, 2022). Academics, policy analysts, and intellectuals have all given the connection between global trade and economic growth a significant deal of study because of the enormous benefits it brings. The Asian tigers, who adopted trade liberalization and promoting exports tactics to achieve extraordinary sustained growth, provided additional encouragement (Frank et al., 2023). Developing countries have since copied these strategies but are still lagging behind.

An increasing curiosity in the function of international commerce, according to Maureen (2015), is a result of the multiculturalism wave, which includes not only economic integration and transparency but also technological advancements that are highly beneficial for increasing and reviving the production industry effectiveness in an economy (Frank et al., 2023).

### **Problem statement.**

The policy scientists in Uganda don't seem to have used their practical expertise in international trade and how it spurs cumulative economic expansion, and therefore they didn't take into account the country's declining trade openness. It is clear that Uganda's

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manufacturing system is distorted, preventing nascent firms from finally competitive on price on the international market. This is due to rivalry between foreign firms. Consequently, developed nations have benefited more from international commerce than Uganda. This is also a result from agricultural exports, which only generate modest revenue. According to UBOS (2019), which reveals that Uganda's yearly trade disparity in 2018 and 2017 was US\$3,155.5 million and US\$2,225.9 million, respectively (Victor et al., 2022) this is exacerbated worse by the import of non-capital goods. This is due to a huge increase in imports of 19.6 percent in 2018. Despite the foregoing observations, it is still unclear how international trade and Uganda's economic development are related, which makes this study necessary.

### Specific objective.

- a) To evaluate the impact of exports on economic growth.
- b) To assess the effect of imports on economic growth.
- c) To establish the effect of foreign direct investment on economic growth.

### Research hypotheses.

Ho1: Exports have no significant impact on economic growth.

Ho2: Imports have no significant impact on economic growth.

Ho3: Foreign direct investment has no significant impact on economic growth.

## METHODOLOGY

### Research design

#### Data source

In Uganda, annual time series secondary data spanning the years 1988 to 2018 were used in the analysis. Gross domestic product, exports, imports, and investment from abroad indicators are all included in the secondary data collection and were all taken from World Development Indicators (2019).

#### Econometric model

##### Model specification

The econometric model for this precise study is;

$$GDP=f(\text{exports imports,foreign direct investment})$$

This type of production function is essentially effective for developing countries like Uganda greatly endowed with natural resources which require expensive imports to extract them.

**This can be expressed in linear form as:**

$$\ln GDP_t = \beta_1 \ln EXP_t + \beta_2 \ln IMP_t + \beta_3 \ln FDI_t + u_t$$

Where

GDP-Economic growth (current US dollars)

EXP-exports of goods and services (current US dollars)

IMP-imports of goods and services (current US dollars)

FDI-Foreign Direct Investment inflows (BOP, current US dollars)

T-time series observations for the period 1988-2018.

The vestige of other variables is contained predominantly in the error term expressed as u.

### Estimation techniques

#### Descriptive analysis

To ensure regularity of transportation, the time series data underwent a descriptive analysis. These include a measure of heterogeneity (standard deviation, skewness, and kurtosis) as well as measures of central tendency (mean, median, and mode).

#### The technique of correlation

To ascertain whether there is a statistically significant connection between each factor and whether one variable can be anticipated from another, correlation tests were conducted.

#### Test for diagnosis

Unit root tests were used to conduct stationarity tests as a preliminary for time series data. A long run and short run connection between the parameters was also constructed for objectives of making policy recommendations in Uganda if the data meet the requirements for linearity.

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### 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 22.96 percent, 20.92 percent, 21.569 percent and 18.92 percent for the variables LNGDP, LNEEXPORTS, LNIMPORTS and LNFDI respectively.

**Table 1: Descriptive Statistics**

	LNGDP	LNEEXPORTS	LNIMPORTS	LNFDI
Mean	22.96399	20.92148	21.56930	18.92272
Median	22.60803	20.54599	21.19126	19.16262
Maximum	24.03605	22.40177	22.79258	21.01379
Minimum	21.77320	19.24242	20.34054	13.81551
Std. Dev.	0.731792	1.069905	0.880095	2.039908
Skewness	0.198086	0.072485	0.195692	-1.253184
Kurtosis	1.681823	1.592694	1.503364	3.491706

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 0.73 percent, 1.07 percent, 0.88 percent and 2.04 percent for the variables LNGDP, LNEEXPORTS, LNIMPORTS, LNFDI 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	LNEEXPORTS	LNIMPORTS	LNFDI
LNGDP	1.000000	0.989318	0.991527	0.782762
LNEEXPORTS	0.989318	1.000000	0.993398	0.827940
LNIMPORTS	0.991527	0.993398	1.000000	0.804801
LNFDI	0.782762	0.827940	0.804801	1.000000

Source: Author's computation.

Given that LNGDP and LNEEXPORTS have a correlation value of 0.989, it is obvious that the two are strongly and favorably correlated. Similar to this, a Pearson correlation coefficient of 0.992 implies that there is a strong relationship between LNGDP and LNIMPORTS. The correlation value between LNFDI and LNGDP, on the other hand, is 0.783, showing a strong and significant positive relationship.

This shows that exports, imports, and inflows of foreign direct investment—the study's independent variables—have a strong positive relationship with the dependent variable (LNGDP), which means they are substantially associated with economic growth.

#### 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. All variables were found to have a unit root at level but are differenced to induce stationarity. This implies LNGDP, LNEEXPORTS, LNIMPORTS, LNFDI were integrated of order one.

**Table 3 Augmented Dickey Fuller test for LNGDP at level and first difference.**

At level			
ADF Test Statistic	1.363769	5% Critical Value	-1.9530
At first difference			
ADF Test Statistic	-2.414257	5% Critical Value	-1.9535

Source: Author's computation.

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Ho: LNGDP has a unit root.

We adopt the null hypothesis that LNGDP has a unit root and deduce that LNGDP is not I (0) because LNGDP is non-stationary at level since the tau statistic for the test (1.363769) is less than the 5% critical value (-1.9530) in the sense of absolute values.

After differentiating, we discover that LNGDP is constant and consequently a component of order one, and we rejected the null hypothesis since the tau test statistic (-2.414257) is larger in absolute terms than the critical value at 5% (-1.9535).

**Table 4 Augmented Dickey Fuller test for LNEXPORIS at level and first difference.**

<b>At level</b>			
ADF Test Statistic	1.464443	5% Critical Value	-1.9530
<b>At first difference</b>			
ADF Test Statistic	-2.605286	5% Critical Value	-1.9535

Source: Author's computation.

Ho: LNEXPORIS have a unit root.

We adopt the null hypothesis that LNEXPORIS has a unit root and deduce that LNEXPORIS is not I (0) because it is unpredictable at level since the tau test statistic (1.46443) is below the 5% critical threshold (-1.9530) in terms of absolute magnitude.

Because the standard deviation of the tau test statistic (-2.605286) is greater than the critical value at 5% (1.9535), we reject the null hypothesis and conclude that LNEXPORIS is continuous at the first distinguished standing, or consolidated of order one.

**Table 5: Augmented Dickey Fuller test for LNIMPORTS at level and first difference**

<b>At level</b>			
ADF Test Statistic	-0.586888	5% Critical Value	-2.9665
<b>At first difference</b>			
ADF Test Statistic	-3.339015	5% Critical Value	-2.9705

Source: Author's computation.

Ho: LNIMPORTS have a unit root.

Since the unit root is accepted and LNIMPORTS is unpredictable at level, not I (0), the tau test statistic (-0.586888) in absolute terms is smaller than the 5% critical value (-2.9665) in absolute terms.

We reject the null hypothesis and come to the conclusion that LNIMPORTS is stable at first variance and thus incorporated of order one because the tau test statistic (-3.339015) in terms of absolute values is bigger than the crucial value at 5% (-2.9705).

**Table 6: Augmented Dickey Fuller test for LNFDI at level and first difference.**

<b>At level</b>			
ADF Test Statistic	-2.303730	5% Critical Value	-2.9665
<b>At first difference.</b>			
ADF Test Statistic	-3.981645	5% Critical Value	-2.9705

Source: Author's computation.

Ho: LNFDI has a unit root. We accept the unit root because the tau test statistic (-2.303730) is smaller than the 5% threshold value (-2.9665) in terms of absolute values. This means that LNFDI is not I(0) because LNFDI is non-stationary at level.

We reject the null assumption and come to the conclusion that LNFDI is integrated of order one since, upon differentiation, the tau test statistic (-3.981645) in absolute terms is higher than the crucial value at 5% (-2.9705).

A cointegration test is required because results indicate that all parameters are integrated to order one.

### Cointegration tests.

Variables are said to be cointegrated implying that they move in the same direction over time only and only if the error term is stationary thus I(0). Otherwise, if it found to be non-stationary, then the model is spurious or useless. A long run model consisting of LNGDP, LNEXPORIS, LNIMPORTS and LNFDI was estimated. The residuals were subjected to an Augmented Dickey Fuller test and were found to be stationary at 5 percent level of significance. Table 7 presents the unit root test results for the residuals at level.

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**Table 7: Augmented Dickey Fuller test for residuals at level.**

Variable	ADF test statistic	5% critical value	ADF test statistic	5 % critical value	ADF test statistic	5%critical value
Residual	-3.740692	-2.9665	-3.655529	-3.5731	-3.770121	-1.9530

Residuals from the long run equation are found to be stationary since the tau statistics in absolute terms are greater than the 5% critical value in absolute terms at level thus concluding that the residuals are stationary. This confirms that cointegration exists amongst LNGDP, LNEEXPORTS, LNIMPORTS and LNFDI thus the need to carry out an error correction model for estimation of results.

### Presentation of empirical findings.

Table 8 presents the long run model used to assess the relationship between the variables and LNGDP.

**Table 8: Long run model with LNGDP as the dependent variable.**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.331172	0.788631	8.028049	0.0000
LNEEXPORTS	0.350451	0.146009	2.400196	0.0235
LNIMPORTS	0.457828	0.167712	2.729847	0.0110
LNFDI	-0.030343	0.014801	-2.050039	0.0502
R-squared	0.986635	Mean dependent var		22.96399
Adjusted R-squared	0.985150	S.D. dependent var		0.731792
S.E. of regression	0.089176	Akaike info criterion		-1.876498
Sum squared resid	0.214713	Schwarz criterion		-1.691467
Log likelihood	33.08572	F-statistic		664.4118
Durbin-Watson stat	1.361851	Prob(F-statistic)		0.000000

Source: Author's computation.

Long-term economic growth is increased by 0.35% for every 1% rise in exports, providing all other factors remain constant. Exports may have a positive, statistically noteworthy effect on the growth of the economy because the p-value (0.0235) is less than 0.05. Provided all other factors remain stable, the long-term expansion of the economy is improved by 0.035 percent for every 1 percent rise in imports. It is clear that imports have a large and beneficial impact on growth in the economy because the p-value (0.0110) is less than 0.05 (Frank et al., 2023).

If all other factors remain constant, a 1 percent increase in foreign direct investment results in a 0.03 percent decline in economic growth. This shows that foreign direct investment has a significant detrimental effect on the expansion of the economy as a whole. The R2 statistic of 0.987 indicates that exports, imports, and investments from abroad account for 99 percent of variations in economic expansion. Other elements in the error term only contribute 1% to the explanations; they are therefore excluded from the model. The data is well-fitted, and since the R2 is high, the fit is also good.

The F statistic of 664.4118, which has a p value of 0.000, which is less than 0.05, suggests that all variables' long-term effects on the economy are modest.

Remains from the long run model were lag-exposed and intersected with various exogenous factors to ascertain the short run relationship between the variables. It is significant to remember that the pace at which the short run model is adjusted to the long run model is the error correction term. At a 5% level of importance, it is anticipated to be significantly different and negative. The short run model outputs with DLNGDP as the variable that is dependent are shown in Table 9.

**Table 9: Regression estimation results with DLNGDP as the dependent variable.**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002735	0.015299	-0.178751	0.8596
D(LNEEXPORTS)	0.209247	0.095278	2.196177	0.0376
D(LNIMPORTS)	0.496501	0.150707	3.294485	0.0029
D(LNFDI)	0.006429	0.021424	0.300060	0.7666
ECM (-1)	-0.570101	0.190878	-2.986735	0.0062
R-squared	0.767088	Mean dependent var		0.047987

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Adjusted R-squared	0.729822	S.D. dependent var	0.142963
S.E. of regression	0.074310	Akaike info criterion	-2.210131
Sum squared resid	0.138049	Schwarz criterion	-1.976599
Log likelihood	38.15197	F-statistic	20.58420
Durbin-Watson stat	1.822109	Prob(F-statistic)	0.000000

Source: Author's computation.

An upsurge in exports of 1% causes a rise in economic growth of 0.21% while all other factors remain constant. In keeping with the results of Romanus & Dickson (2019) in Tanzania, the p-value of 0.0376, which is less than 0.05, implies that exports have a sizable beneficial impact on economic growth.

All other factors being equal, a 1% increase in imports results in a 0.5% gain in economic expansion. According to the results of Ebrima et al. (2019) for the Gambian context, the p-value (0.0029) is less than 0.05, showing that imports make a significant contribution to financial growth.

Assuming that all other factors remain constant, an increase in investment from overseas of 1 percent results in an increase in economic growth of 0.006 percent. The p-value (0.766), which is larger than 0.05, indicates that investment from overseas has a negligible but positive effect on the economy's expansion. In addition to the conclusions reached by Okonkwo et al. (2015) and Masipa (2018) for the respective Nigerian and South African contexts.

Exports, imports, and foreign direct investment account for a combined 77% of changes in economic growth, according to the R2 statistic of 0.76708. Other elements in the error term contribute 23% of the explanation; as a result, the model does not include them. The data is well-fitted, and since the R2 is high, the fit is also good. The statistically important negative error correction term indicates that 57% of the incompatibility adjusts with a one-year lag while controlling for other variables.

The fact that the F statistic is 20.58420 and the p value is 0.000, which is less than 0.05, suggests that all of the variables together have a significant short-term impact on the economy's expansion.

### Diagnostic post estimation tests.

Diagnostic tests are carried out to ensure the residuals are normally distributed, homoscedastic and no presence of auto correlation.

**Table 10. Ramsey RESET Test:**

Ramsey RESET Test:			
F-statistic	0.183113	Probability	0.672527
Log likelihood ratio	0.228023	Probability	0.632994

Source: Author' computation.

Ho: The model is correctly specified.

We accept the null hypothesis and conclude that the model is correctly specified since the probability value (0.673) is greater than 0.05.

**Table 11. Serial correlation test.**

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 serial correlation.

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

## CONCLUSION

This study set out to provide evidence for the international trade economic growth nexus in Uganda while using exports, imports and foreign direct investment as proxy variables for the period 1988-2018. It was empirically confirmed that exports, imports and foreign direct investment had a strong positive significant relationship with economic growth.

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Unit root tests were performed using the Augmented Dickey Fuller test, and the outcomes demonstrated that all variables were initially non-stationary but subsequently became static. Due of the long-term correlations between the variables, cointegration was established using the Engle Granger Cointegration, also test. The variables' rate of adaptability to the long run within a one-year lag was 57%. For 77% of changes in economic output, exports, imports, and investment from abroad were all taken into account. 23% of the variations in economic growth were caused by other variables in the error term that were not taken into account for in the model (Nelson & Christopher, 2022). Exports, imports, and foreign direct investment all significantly affect economic growth in the short run, according to the statistical significance of the F statistic.

### Policy Implications and Recommendations.

It was found that imports, exports, and foreign direct investment all had an impact on economic development over the long and short terms, indicating a strong positive relationship between these variables and global trade. For purposes of policy implications, the investigator advises the following to make the connection that follows significantly more obvious:

It has been found that exports have a substantial impact on economic growth. Export improvements in value should be encouraged to ensure increased profitability. This is due to the fact that the majority of exported items are related to agriculture, demanding an upgrade in quality. To increase the GDP of the economy, Uganda should from now on support the export development strategy. The agriculture industry should receive more funding in order to increase productivity.

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