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EXPORT AND ECONOMIC GROWTH IN TANZANIA: CO-INTEGRATION AND CAUSALITY ANALYSIS

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ABSTRACT

Purpose: This study examines the co-integration and causal relationship between exports and economic growth in Tanzania using time series data from 1998 to 2018.
Design/Methodology/Approach: Gross Domestic Product (GDP) was employed to measure economic growth, while exports of all products (from agricultural, industrial, and mineral products) were extracted from country trade statistics and employed as the independent variables. Data analysis was done after some tests, such as stationary tests, co-integration, regression analysis, and Granger causality. The stationary test result suggested using unrestricted vector autoregressive (VAR) analysis, followed by the Granger causality test.
Findings: It revealed that those exports significantly influence Tanzania's economic growth, which implies that an increase in exports provides the market for domestically produced goods and services and thus promotes more production and economic growth. The study further confirms that economic growth does not significantly influence exports from the country. However, it was further revealed that the causality between export and economic growth is not bi-directional.
Research Limitation: Historical data may not reflect current economic conditions. Hence, there were restricted degrees of freedom when adopting complex modelling.
Practical Implication: Promoting more exports will encourage domestic producers to increase production, eventually fuel economic growth.
Social Implication: The study recommends that policymakers develop strategies for increasing the diversity of exported products and local production capacity.
Originality/Value: The novelty lies in integrating Granger causality testing with cointegration analysis for Tanzania's trade context. These novelty aspects contribute to methodological advancement and practical understanding of Tanzania's economic dynamics, providing valuable insights for policy formulation and future research.

Keywords: *Causality. co-integration. economic growth. exports. Tanzania.*

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INTRODUCTION

Economic development is significant to any country, and it is regarded as one of the main focuses of any government in power; in line with the same, exports are also considered one of the important engines for the economic growth of a country. Export-led growth is the development strategy focusing on increasing productive capacity by engaging international markets (Orhan et al., 2022). Exports provide one of the most reliable sources of foreign exchange, which is very useful in importing capital goods, enhancing the capability to produce more goods and services, compete in the outside world and create more job opportunities (Choi et al., 2021).

As contended in the study by De Ferra (2020), exports can integrate a country's economy into the world economy and help absorb the impact of external shocks on the internal economy. They also added that exports ease pressure on the balance of payments and generate much-needed job opportunities. According to Keynesian arguments, growth in a country's exports leads to income growth through the foreign exchange multiplier in the short run. Moreover, more foreign exchange obtained from exports can contribute to economic growth, resulting from the multiplier effects realised through importing manufactured goods, capital goods, and technology (Shah et al., 2015).

Through export, the objective of rapid economic development can be realised in developing countries such as Tanzania. As contended in the argument of classical economic theories of Adam Smith and David Ricard, the need for international trade is inevitable in realising economic growth, and there is more economic gain from specialisation (Shah et al., 2015). Evidence can be drawn from fast-growing economies in Asian countries. Tsen (2006) added that East Asian economies provide a good example of the sector's importance to economy and development and signifying the sector's role as the engine of growth. Export is well known for its contribution to creating employment opportunities and the primary source of foreign currencies to the country (Orisadare et al., 2017).

Like many African countries, after independence, Tanzania inherited an economy whose exports were dominated mainly by primary products, such as agricultural products and minerals, under a private-led capitalist economy.

In 1967, the country decided to take a different direction and pursued African socialism, "Ujamaa", where all means of production were owned, controlled and managed by the state; in this stage, the government had a role not only to promote export but also to participate in the exportation of all

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products. To enhance her capacity to export, the government adopted an import substitution industrialisation strategy, which resulted in many state-owned firms. However, due to trade liberalization in the mid-1980s, the country started to re-embrace the private sector; the move allowed the market-led economic system, which allowed the private sector to take charge of production and exportation (Bwana & Omary, 2019).

The government adopted a more relaxed approach during the late 1980s and early 1990s. It introduced more incentives (such as tax holidays for foreign investors, export processing zones, etc) to attract and promote exports. For example, among other reasons, designated export processing zones were established to attract investments, create job opportunities, focus on export-oriented manufacturing, increase the number of products in the country's export structure and facilitate the transfer of technology. Therefore, the efforts made so far and continue to be done indicate that exports have significantly contributed to the economic growth of Tanzania, though research validating such a causal relationship has been given little attention in Tanzania. According to the World Bank report, the status of total Tanzania exports to the world in 2018 was USD 3,669,212,440, while in the year 1998, it was USD 630,078,400 (Wits, 2018), implying an increase of 482.3%

The general objective of this paper is to examine the causal relationship between exports and economic growth in Tanzania from 1998 to 2018. Specifically, the study tests whether exports cause economic growth, whether the causality runs from economic growth to exports, or whether the causality between exports and economic growth is bidirectional.

The significance of the study can be rationalised from the fact that Tanzania has undergone various economic reforms, some of which are aimed at improving production and enhancing export capacity, and still, literature is evident that there is an uncovered gap regarding the analysis of the causal relationship between export and Tanzania's economic growth. It is worth noting that determining the direction of causality between export and economic growth can help formulate the best trade and economic strategies. The remaining parts of this paper are structured as follows; section two comprises literature regarding the export-led growth strategy in different countries; section three explains the Granger causality testing and other analytical techniques employed in the study; section four presents findings and discussion of previous studies, while conclusion, recommendations as well as policy implications is covered in section five.

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LITERATURE REVIEW

A good number of works of literature try to examine the causal relationship between exports and economic growth. However, the result is mixed, and the conclusion is still subject to debate. Generally, empirical studies indicate that the hypothesis of export-led economic growth can be tested from two angles, such as the export impact on a group of countries (through a cross-section study design) and the export impact on the economic growth of a single country (designed through cross countries time series) (Abbas, 2012). Therefore, this study adopted a second approach by testing the impact of Tanzania exports on economic growth. Like in many African countries, it is worth noting that Tanzania's comparative advantages depend on processing the primary products. Jordaan and Eita (2007) added that in any country, the growth of the export sector begins with a readily available input supply that feeds the manufacturing sector.

Similar studies have also been conducted outside Africa, to mention a few. For example, Pistoresi and Rinaldi (2012) examined the relationship between imports, real exports, imports and GDP in Italy from 1863 to 2004. Cointegration and causality tests were used. The findings record that co-integration exists, but the direction of causality is not consistent since it tends to vary over time. Specifically, during the period prior to the First World War, import growth led to GDP growth, which turned into GDP-led export growth, while post-Second World War, bidirectional causality was observed.

Mah (2005) investigated the causality between export expansion and economic growth in China over the period 1979-2001, where the error correction model revealed a bi-directional causality between the variables under review. Shan and Sun (1999) tested the causality hypothesis of export-led growth for the USA. The result validated a two-way Granger causality between the variables. In a study by Ramos (2001), Granger-causality between exports, imports, and GDP were investigated in Portugal for the period 1865-1998. Findings revealed no significant causality between the variables under review. In a study by Lorde (2011), the validity of the export-led growth hypothesis for Mexico was tested using cointegration and Granger causality; the study period covers the period 1960-2003. Empirically, findings revealed only short-run causality from export to economic growth. In the long run, findings revealed inverse causality from economic growth to exports.

In Japan, Hatemi-j (2002) investigated the causal relationship between export growth and economic growth by employing the augmenting Granger causality test, where the study period

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covered 1960-1999. The findings revealed a bi-directional causality run between the variables. Sharazi and Manap (2004) investigated the impact of exports on the economic growth of Pakistan; researchers employed multivariate Granger causality from 1960 to 2003. Findings confirm that exports have an impact on Pakistan's economic growth.

Studies investigating export and economic growth have also been conducted in Africa; for example, Ukpolo (1998) carried out a Granger causality test to investigate the relationship between exports and economic growth in South Africa. The study period covered 1964-1993. Results fail to confirm the export-led growth as reverse causality is observed. Jordaan and Eita (2007) conducted a study testing the hypothesis of export-led growth of Botswana over the period 1996-2007, the analysis of which the Granger causality test was employed, finding validated the existence of bi-direction causality between export and GDP.

Bouoiyour (2003) examined the relationships between trade and growth in GDP in Morocco for the period 1960-2000, during which the VEC model was employed. The findings revealed that imports Granger caused exports and imports and exports Granger caused GDP. In a study by Elbyedi, Hamuda and Gazda (2010) export-led growth was tested in Libya over the period 1980-2007, VECM was employed, and the result recorded strong support for the existence of long-run bi-directional causality between the two variables (export and GDP). Generally, findings regarding the impact of the export-led economic prosperity of specific countries revealed mixed results. In some studies, it was reported that exports had a substantial impact on GDP, while in some studies, research failed to confirm the validity.

METHODOLOGY

The main objective of this paper is to analyse the causality between exports and Gross Domestic Product (GDP) in Tanzania. The study utilises the times series data for 20 years covering 1999 and 2018. The data were obtained from the World Development Indicators (WDI) published by the World Bank. The data for the two variables used were expressed in USDs. To estimate the causality between the two variables, the study made use of the Granger causality approach (Granger, 1969).

According to this approach, a variable is said to Granger-cause another variable if the past and present values of that variable can predict the other variable, (Jordaan & Eita, 2007)In our case, exports are said to Granger-cause GDP if the past and present values of exports can predict GDP. Since we intend to test the two-way causality between exports and GDP, the GDP will also be said

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to Granger-cause Exports if the past and present values of GDP can predict exports. Therefore, the Granger causality between Exports and GDP can be expressed as seen in equations 1 and 2.

$$Exports_t = \sum_{j=1}^{n} \varphi_J \, Exports_{t-j} + \sum_{j=1}^{n} \alpha_j \, GDP_{t-j} + \varepsilon_t \quad \text{.....1}$$

$$GDP_t = \sum_{j=1}^{n} \gamma_j GDP_{t-1} + \sum_{j=1}^{n} \beta_j Exports_{t-1} + \mu_t \quad \text{.....2}$$

Equation 1 means that Exports are determined by their past level and the past level of GDP while equation 2 means that GDP is determined by its past level and the past level of Exports. The two equations will be estimated by testing two hypotheses stated as follows:-

i. $H_0 : \propto_j = 0 \, ; j = 1 \ldots\ldots\ldots\ldots n$ Or GDP does not Granger cause Exports.
ii. $H_0 : \beta_j = 0 \, ; j = 1 \ldots\ldots\ldots\ldots n$ Or Exports do not Granger cause GDP.

Rejection of all the two null hypotheses means that there is a bidirectional causality between exports and GDP. Exports Grower cause GDP, while GDP also growser causes exports. However, if only one hypothesis is rejected, then there is a unidirectional causality. If only the first hypothesis is rejected, it means that GDP growser causes Exports, and if only the second hypothesis is rejected, then it means that only Exports grower causes GDP.

Since this analysis involves time series data that are inherently integrated of order one (I (1)) and may be cointegrated, it was important to test the stationarity of the variables before proceeding further. The Augmented Dickey Fuller (ADF) and the Philips Peron (PP) tests were used to perform the unit root test or the stationarity of the data. Under this, the null hypothesis was that the variables had a unit root or were not stationary.

The rule of thumb requires us to perform the Johansen cointegration test if the variables are not stationary at level but are stationary after the first difference, that is, if they are I (1). If again the variables are cointegrated, the rule requires to opt for the Vector Error Correction Model (VECM) instead of the unrestricted Vector Autoregression (VAR) followed by the Granger causality test, (Elias et al., 2023; Søren Johansen, 2000; Johansen & Juselius, 1990;). If the Johansen cointegration test proves the non-existence of cointegration, however, the unrestricted VAR can be run without necessarily running the VECM, (Søren Johansen, 2000).

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The lag length for all estimations was selected based on the minimum Akaike Information Criterion (AIC), Schwarz Bayesian Information Criteria (SBIC), and Hannan-Quinn Information Criterion (HQIC).

RESULTS AND DISCUSSION

The results of the ADF are presented in Table 1. The finding indicated that export was not stationary at the level. However, it turned out to be stationary after the first difference. GDP was found to be stationary at this level, and therefore, the first difference was not made.

Table 1: Augmented Dickey Fuller Unit Root Test

Variable	At Level		First Difference	
	Test statistic	5% critical value	Test statistic	5% critical value
Exports	0.402	-3.600	-4.210*	-3.600
GDP	-3.796*	-3.600	-	-

* indicates rejection of the null hypothesis in favour of the alternative that there is a unit root at 5% significance level.

To confirm the results obtained by running the ADF, another test was necessary. The PP test for unit root was performed, and the results are presented in Table 2.

Table 2: Philips Peron Unit Root Test

Variable	At Level		First Difference	
	Test statistic	5% critical value	Test statistic	5% critical value
Exports	-1.423	- 12.500	-17.248*	- 12.500
GDP	0.151	- 12.500	-13.812*	- 12.500

* indicates rejection of the null hypothesis in favour of the alternative that there is a unit root at 5% significance level.

From the PP test results shown on table 2 we can see that all the two variables were not stationery at level. However all of them become stationery after the first difference showing that they are I (1).

Since all the variables were I (1) based on the two unit root tests, it was necessary to run the Johansen cointegration test to test for the long run relationship between the two variables using

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the Johansen full information maximum likelihood. In this study, the cointegrating rank is tested using the Trace statistics and the maximum eigenvalue developed by Johansen and Juselius, (Johansen & Juselius, 1990). Table 3 shows the results of the Johansen cointegration test.

From the table it can be observed that at rank 0 showing the null hypothesis that there are 0 cointegrated variables, both the trace statistics and the maximum Eigen value are less than the 5% critical values. This suggests that we cannot reject the null hypothesis that there are 0 cointegrated variables shown by the respective maximum rank.

Table 3: Johansen Cointegration Test

Maximum Rank	**Trace statistic**	**5% Critical value**
0	6.2390*	15.41
1	0.2014	3.76
Maximum Rank	**Max statistic**	**5% Critical value**
0	6.0376*	14.07
1	0.2014	3.76

* indicates the failure to reject the null hypothesis that there are zero (0) cointegrated variables at a 5% significance level.

Since the Johansen cointegration test shows the absence of cointegration between the variables, we can estimate the Vector Autoregression (VAR) instead of the Vector Error Correction Model (VECM). The VAR was therefore estimated, and its diagnostic test followed it, the Granger causality test. The results of the Granger causality test after estimating the VAR are shown in Table 4.

Table 4: Granger Causality Results

Null Hypothesis	**Wald Statistic**	**Probability**
Export does not cause GDP	3.9635*	0.0433
GDP does not cause Export	0.0718	0.9310

* Indicates rejection of the null hypothesis in favour of the alternative that Export Granger causes GDP at a 5% significance level.

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From the Granger causality results, it can be observed that since the probability value under the first null hypothesis was below 0.05 critical value, we could reject the null hypothesis in favour of the alternative that Exports Granger caused GDP in the study period. However, since the probability value was more significant than the 0.05 critical value under the second hypothesis, we failed to reject the null hypothesis that GDP does not cause exports. Similar studies which have revealed the same results that Exports Granger causes GDP in a unidirectional way include:- (Akoto, 2016; Jordaan & Eita, 2007; Yang, 2015) among others. However, other studies have revealed the opposite unidirectional relationship, showing that GDP growth causes exports. These include:- (Abbas, 2012; Dudzeviute, Šimelyte, & Antanavičienė, 2017). Other studies have shown bidirectional causality between exports and GDP. An example of this is the study by Dudzeviute et al., (2017) which showed a bidirectional causality between exports and GDP in Denmark.

CONCLUSION

From the findings of this study, we can conclude that exports significantly influence Tanzania's economic growth, as measured by GDP. This likely implies that the increase in exports widens the domestically produced goods and services market, thus fueling more production and economic growth. On the other hand, it can also be concluded that economic growth does not significantly influence exports from the country. This likely suggests that the economic growth reflected by the increase in the monetary value of goods and services produced may not necessarily be translated into an increase in exports. For developing countries such as Tanzania, much of what is produced is consumed domestically and may not be exported.

These results signal the need for policies in the country to focus on the export driven-economic growth. Exports have proven to significantly influence economic growth, and therefore, export promotion is likely to fuel economic growth in the country. It is expected that promoting more exports will encourage domestic producers to increase production, and eventually, this will fuel economic growth. The study recommends that policymakers should have strategies to increase the diversity of exported products and local production capacity, which has caused a spillover of technology and other externalities. The study suggests that the natural extension of this study should try to establish the diversity and nature of the exports and their respective impact on economic growth. Future research may also test the impact of other variables, such as foreign direct investments, on Tanzania's economic development.

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