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ORIGINAL PAPER

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THE IMPACT OF TRADE LIBERALIZATION ON THE PERFORMANCE OF TANZANIA'S EXPORT SECTOR – A TIME SERIES ANALYSIS FROM 1980 TO 2019

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ABSTRACT

Aim: This article aims to enhance understanding of the impact of trade liberalization on Tanzania's export performance. As many studies conducted, both in developing and developed countries, have yielded mixed results and the relationship varies across different nations, it is difficult to provide a definitive answer to the question of whether trade liberalization affects Tanzania's export sector without first conducting an empirical analysis. **Methods:** This study employs a quantitative research methodology because it allows for a larger sample size, greater objectivity, and accuracy. Due to the nature of the study and the data used, a statistical study design was chosen. Macroeconomic data spanning 1980 to 2019 was obtained from the World Bank and the Tanzania Bureau of Statistics to analyze the effects of trade liberalization on export performance using vector error correction and autoregressive distributed lag models. **Results:** The results reveal a significant positive correlation between trade liberalization and subsequent export performance, as well as the interdependencies between trade liberalization and foreign direct investment (FDI) strategies. There is a reciprocal relationship between trade liberalization and exchange rates, implying the significance of competent exchange rate management in enhancing export competitiveness. **Conclusions:** The study concludes that trade liberalization, FDI, and export performance have a long-term positive correlation. This implies that a carefully executed trade liberalization policy is crucial not only for the expansion of the export industry sector and the influx of capital, but also for the transformation and development of the nation.growth.

Keywords: international trade, trade liberalization, Vector Error Correction Model (VECM), Autoregressive Distributed Lag (ARDL), international economics, economic growth

JEL codes: B17, F43

INTRODUCTION

The majority of nations, both those with strong and weak economies, have made improving export performance one of their macroeconomic goals [Ocampo 2004, Manamba 2016, Güneri 2019, Cramer et al. 2020, Nguyen 2020]. Tanzania made the decision to implement a number of trade and fiscal policy reforms beginning in the early 1990s by offering incentives to promote exports and balance trade terms [Rwenyagila 2013, Kingu 2014a, Manamba 2016]. One of these incentives was the adoption of trade liberalization

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policies, which were meant to give countries the opportunity to grow their economies, increase exports, and promote overall development [Kanaan 2000, Kazungu 2009, Manamba 2016, Modeste 2019].

Thindwa and Seshamani [2014] and Vassilyeva [2017] both claim that trade liberalization is a key factor in improving export performance, as well as boosting growth and supporting overall development. Additionally, despite some year-to-year fluctuations, Tanzania's export performance has shown an upward trend from 1990 to 2019, in line with the World Bank's observations. For example, exports were USD 0.54 billion in 1990, increased to USD 1.30 billion in 1996, dropped to USD 1.30 billion in 1997, and then increased again to USD 1.45 billion in 2000. After that, export growth slowed until it reached USD 9.79 billion in 2019, the highest annual total ever [World Bank 2021].

Furthermore, different researchers have found conflicting results regarding the relationship between export performance and trade liberalization. Some studies suggest a positive correlation between trade liberalization and export performance in certain countries, while others suggest a negative correlation. According to [Penelope 2005, Utouh et al. 2016, Shobande 2019], trade liberalization enhances the export performance of liberalized economies by providing access to new technologies from trading partners that can stimulate growth in other sectors. On the other hand, Ahmed et al. 2014 and Thindwa and Seshamani [2014] argue that trade liberalization has a negative impact on export performance, and that liberalizing trade does not necessarily improve an economy's exports. Furthermore, Babatunde [2009] suggests that trade liberalization only has a minor impact on improving export performance in sub-Saharan African nations. Based on the discussions above, it is clear that ongoing debates exist in the fields of economics and globalization regarding the relationship between export performance and trade liberalization. Additionally, numerous studies have been conducted in various economies, both developed and developing, and the relationships between nations vary, despite contradictory findings in this area. While studies on trade liberalization and export performance have been conducted in Tanzania, they tend to focus more on agricultural exports than other types. These factors highlight the need to study how trade liberalization specifically affects Tanzania's export performance and its overall economy.

THEORETICAL FOUNDATIONS

The Trade Liberalization Theory, which Neo-Liberals [Krueger 1974] promoted as an outward-looking strategy rather than an inward-looking one, serves as the foundation for the main argument of this paper. This is because an outward-looking strategy focuses on producing for both the domestic and international markets. Neo-Liberals also claimed that trade liberalization is a crucial element for economic growth, export performance, increased import capacity, capital imports for development, and the alleviation of balance of payments issues in liberalized countries [Kitole and Utouh 2023].

The theory was based on the parent theory of international trade put forth by classical economists like A. Smith in 1776 when he established the theory of absolute advantage, and the Ricardian theory of comparative advantage in 1817, which explains the idea of free trade as an engine of economic growth for many nations. However, [Grossman and Helpman 1991, Edwards 1998, Kingu 2014b, Utouh et al. 2016] have criticized both theories of absolute advantage and comparative advantage for assuming perfect competition among trade partners and ignoring matters like trade barriers among trade partners, which are both significant and realistic. Nowadays, when we discuss trade, we primarily refer to large corporations that source components and raw materials from around the world and then market them internationally. And it was the development of technology and trade liberalization that made those corporations possible.

In their studies, Kingu [2014a], Razzaque et al. [2003], Santos-Paulino and Thirlwall [2004] contend that the trade liberalization theory presupposes that countries that liberalize trade may experience economic growth through favorable spillover effects from trade partners. The theory further assumes that under favorable spillover conditions, the nation will increase export performance and generate more job opportunities. In addition to the presumptions made

above, the theory also assumes that through government intervention, a nation may be able to lessen the issue of illegal and unproductive black-market activities. This is because the liberalization policy restricts government intervention, allowing trade partners to import and export freely without too many restrictions [Santos-Paulino and Thirlwall 2004].

Additionally, Hinkle and Montiel [1999] argued that neo-liberals like Cline [1997] were against trade liberalization – especially in developing countries – by arguing that there is little chance for trade liberalization to improve their export performance as it was supposed to because the exports of low-income nations are concentrated in a small number of products with relatively little domestic supply response, and trade reforms that alter relative prices won't have much of an impact.

This theory has been applied in various studies with varying results. Jenkins [1996] examined trade liberalization and export performance in Bolivia and found that export performance in Bolivia is primarily influenced by stable exchange rates rather than trade liberalization. Thus, trade reforms had a negative impact on Bolivia's export performance, proving that some countries are less affected by trade reforms than others. Despite the criticisms of the theory and inconsistent results, the theory of trade liberalization is useful in this study because it is anticipated to shed light on how trade reforms affect Tanzania's export performance.

EMPIRICAL REVIEWS

This section examines the study's supporting literature to identify any gaps that need to be filled. Many empirical studies have been carried out, and different findings have been made using various methodologies, variables, and data sets.

Ahmed [2000] used VAR and VECM to analyze the impact of trade liberalization on Bangladesh's export performance using time series data from 1974 to 1995. The variables used were real GDP, interest rate, a dummy variable, and real exchange rate. The findings demonstrated that Bangladesh's exports increased as a result of trade liberalization. Additionally, it was found that the dummy variable had no impact on export effectiveness. Furthermore, the significance of VECM was identified, pointing to a shift in the variables' direction toward long-term equilibrium. Majeed and Ahmad [2006] used panel data for 75 countries and time series data from 1970 to 2004 to examine the factors influencing exports in developing countries. The real exchange rate, the size of the overall labor force, GDP, and FDI were the variables used in the study. The findings demonstrate that all variables were statistically significant export determinants, except for FDI, which showed positive but statistically insignificant results. This means that because it largely depends on each country's motivation, the influence of FDI in many developing countries continues to be a contentious issue.

Manni et al. [2012] used time series data analysis to examine the effects of trade liberalization on the economy of Bangladesh from 1980 to 2010. GDP, the rate of inflation, exports, imports, and trade openness were the variables used. Ordinary Least Squares (OLS) was one of the methodologies used in the study. The empirical findings demonstrate that trade liberalization had a positive impact on GDP growth while having no impact on inflation. Additionally, a quantitative result demonstrates that economic growth increases with openness. Moreover, trade openness and export and import growth go hand in hand, but trade liberalization policies appear to boost exports, leading to higher economic growth after the 1990s.

Using time series data from 1970 to 2010, Kingu [2014a] examined how Tanzanian clove exports responded to trade liberalization by using econometric techniques like cointegration, the error correction model (ECM), and trend analysis on the variables world price, exchange rate, and clove export earnings. The results of the ECM show a long-term relationship between the variables. The global price increased year over year while remaining positive and statistically significant at 5%, whereas the actual exchange rate was discovered to be positive but statistically insignificant. Ahmed et al. [2014] investigated the impact of various factors, including foreign direct investment (FDI), trade openness, currency value, and inflation on Pakistan's economic development. The study utilized time series data collected from 1980 to 2011. The authors employed co-integration and Dynamics Ordinary Least Square (DOLS) techniques for estimation, as well as tests such as the ADF, PP, and DF-GLS to assess stationarity in the variables. The results of the cointegration analysis revealed a long-term relationship

between the variables. Notably, trade openness was found to have the most significant negative impact on Pakistan's economic growth compared to the other factors. In conclusion, the study highlights the importance of trade and FDI, but not trade openness, in enhancing and influencing Pakistan's economic growth. In Wahab's [2020] research, the focus was on examining the effects of trade liberalization policy on the relationship between FDI in the services sector and economic growth in Nigeria from 1981 to 2018. The study utilized time series analysis and incorporated policy scenarios both with and without a structural break to account for shift dummies in the series. The findings indicated a long-term relationship between services FDI and economic growth. However, it was observed that services FDI promotes growth excluding policy shifts, whereas it slows down growth when policy shifts are included. Under the scenario without the break, the short-run estimate showed a statistically significant positive association with growth. Conversely, under the scenario with the break, the relationship was deemed unimportant and negative. The report suggests that, considering the level of trade liberalization, services FDI can significantly contribute to Nigeria's economic development. Furthermore, despite the widespread adoption of trade liberalization as a means to boost exports and stimulate economic growth, the findings from researchers in various countries have been conflicting. Scholars like Thindwa and Seshamani [2014] and Vassilyeva [2017] argue that trade liberalization plays a pivotal role in positively influencing export performance and contributing to overall development. On the other hand, Ahmed et al. [2016] and Thindwa and Seshamani [2014] propose that trade liberalization might not necessarily lead to an improvement in export performance and that its impact may be relatively minor, particularly in sub-Saharan African nations [Babatunde 2009]. Therefore, this study seeks to address the ongoing debates surrounding the connection between trade liberalization and export performance, with a specific focus on Tanzania's economy. While previous studies have examined this

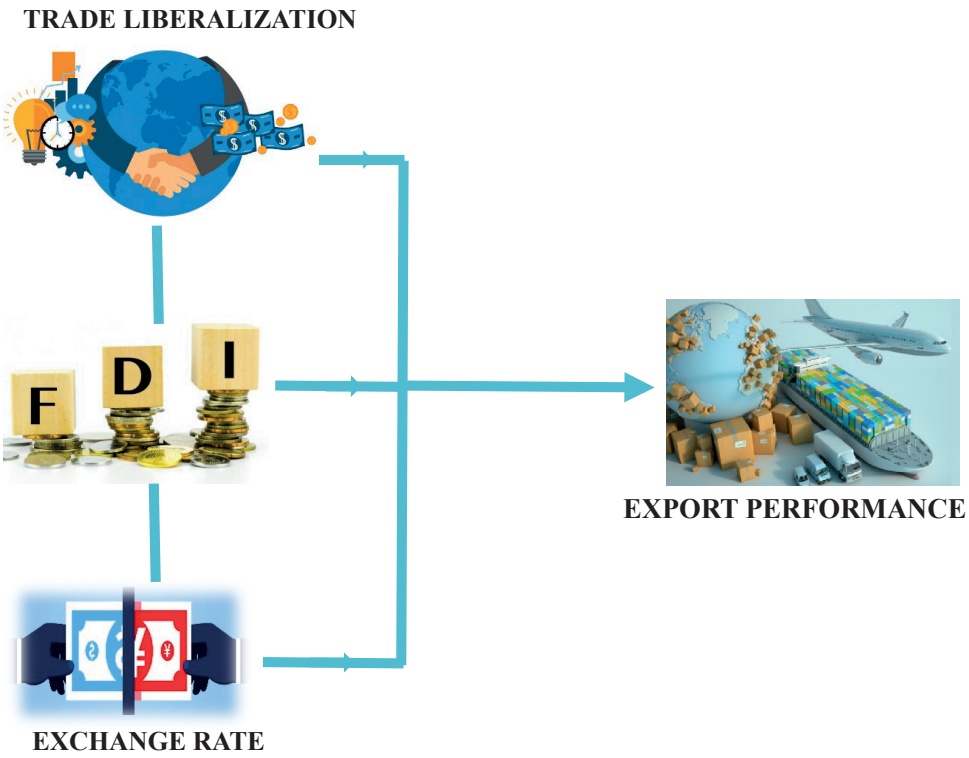

Fig. 1. Conceptual framework
Source: Own elaboration.

relationship in various economies, this research aims to fill a critical gap in the existing literature by providing a comprehensive analysis of trade liberalization's impact on Tanzania's export performance. By exploring the intricate dynamics between trade liberalization measures and export trends, this study aspires to shed new light on the subject and offer valuable insights for policymakers, economists, and stakeholders involved in international trade. In addition, reviews have revealed that Tanzania has little empirical data on the effects of trade liberalization on export performance, and the available literature is dated. This study fills the gap by evaluating the impact of trade liberalization on Tanzania's export performance (Fig. 1).

METHODS AND DATA

This study's research method is quantitative, which is thought to be the best method to use because it allows for the use of a larger sample, greater objectivity and accuracy, and is more cost-effective. The study's study design, based on this research, is a statistical study design. The statistical study design was chosen because of the nature of the study and the data used [Kitole et al. 2022a, b, Kitole and Sesabo 2022]. The data used in this study were sourced from the World Bank [WB 2022] and the Tanzania Bureau of Statistics [NBS 2022]. The need to merge these two sources of data is based on the fact that one source of the data may occasionally have some discrepancies over the years and the other source can be used to correct these discrepancies [Dimoso and Andrew 2021].

The choice of these variables (macroeconomic components) aligns with Tanzania's economic structure, which is built upon the agriculture sector. This sector requires massive transformation, heavy investment, and an improved global infrastructure system that will facilitate the smooth export of raw materials. Thus, trade liberalization is one of the components that facilitate trade and enhance the development of the export sector. On the other hand, trade liberalization indicates the major trade reforms that have been done in Tanzania from 1980 to 2019 to foster economic development and, more specifically, export sector performance [Utouh and Rao 2016]. Consider Tanzania's economic structure presented in Figure 2, which shows its economic dependence on major economic activities.

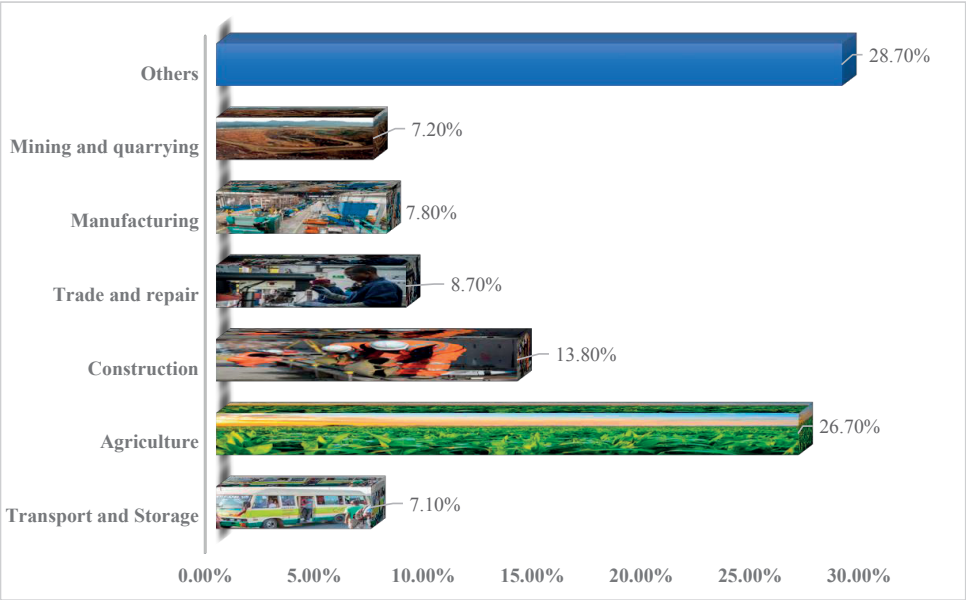

Fig. 2. Economic structure of Tanzania
Source: [Kitole and Utouh 2023].

Therefore, the macroeconomic data obtained from these sources (Table 1) were export performance (EP), exchange rate (EXR), foreign direct investment (FDI), and trade liberalization, which is measured by trade openness as a proxy. In a nutshell, export performance was measured in terms of the values of real exports, which represents the ratio of export to import value to the export-import price index. The choice of this variable is based on the fact that real exports represent the movement of exports and imports in real terms by eliminating the influence of price changes. On the other hand, the exchange rate herein presents the relative price of Tanzania's currency in terms of the dollar. For both small and large open economies, the exchange rate is an important economic variable in any international trade policy [Kitole and Utouh 2023]. Furthermore, foreign direct investment (FDI) used in this study represents an integral driver of economic growth and includes all investments made by foreign entities or individuals in Tanzania from 1980 to 2019.

The Autoregressive Distributed Lag Model (ARDL) was used in this study to examine and analyze the effects of trade liberalization on export performance in Tanzania. The model was developed by Pesaran and Shin [1999] and later enhanced by Pesaran et al. [2001] to examine the possibility of cointegration between variables. This model has several benefits. The first is that it can handle variables with a mixture of stationary and non-stationary time series, such as integrated orders of 1(0) or 1 (1). Second, because it involves only a single equation arrangement, the model is simple to use and interpret. The ability to assign different lag lengths to the model's variables is the third benefit. Another benefit is that it favors small sample sizes and is more adaptable because it can be used even before the cointegration test. Thus, even with the inclusion of the dynamic in the model and regardless of whether the regressors are endogenous, Appling's method will provide an unbiased estimate of the long-run and a valid *t*-test.

The following equation can be used to represent the general ARDL model:

$$\Delta lnTE_t = \alpha + \sum_{i=1}^{k+d} \beta \Delta lnTE_{t-1} + \sum_{i=1}^{k+d} \gamma \Delta lnTO_{t-1} + \sum_{i=1}^{k+d} \varphi \Delta lnFDI_{t-1} + \sum_{i=1}^{k+d} \theta \Delta lnEXR_{t-1} + \lambda_1 lnTO_{t-i} + \lambda_2 lnFDI_{t-i} + \lambda_3 lnEXR_{t-i} + \mu_t \quad (1)$$

Where: $\Delta lnTE_t$ represents the first difference of the natural logarithm of total exports at time t, α is a constant term. Moreover, β, γ, φ, and θ are coefficients

Table 1. Description and measurement of variables

S/N	Variables	Variable prefix	Description	Measurement	Source
Dependent Variable					
1	Export performance (Real export)	EP	Ability to leverage its resources, goods, and services in an international market at a given point of time.	Real export value	World Bank
Independent Variables					
1	Exchange rate	EXR	Rate at which one currency will be exchange for another	Price index	World Bank
2	Foreign direct investment	FDI	investment owned by one country but entity based in another country	Net inflow of FDI (USD)	NBS
3	Trade Liberalization (Trade openness)	TO	Sum of import and export divided by gross domestic product	Total trade/GDP	World Bank

Source: Own elaboration.

representing the short-run effects of lagged variables on the dependent variable, while λ_1,λ_2, and λ_3 are coefficients representing the long-run effects of lagged variables on the dependent variable, μ_t is the stochastic error term, k is the optimal lag order, and d is the maximum order of integration of the variables. Additionally, this equation helps us understand how changes in the natural logarithm of total exports ($\Delta ln\ TE$) are influenced by past changes in total exports, trade openness ($\Delta lnTO$), foreign direct investment ($\Delta lnFDI$), and exchange rates ($\Delta lnEXR$). The model considers both short-run and long-run relationships, with lagged variables and error terms (μ_t) accounting for variations.

On the other hand, the long-run ARDL model is presented in equation 2:

$$lnTE_t = \beta_0 + \lambda_1 lnTO_{t-i} + \lambda_2 FDI_{t-i} + \lambda_3 EXR_{t-i} + \mu_t \quad (2)$$

Where: $lnTE_t$ represents the natural logarithm of total exports at time t, β_0 is a constant term, λ_1, λ_2, and λ_3 are coefficients representing the long-run effects of lagged variables on the outcome variable ($lnTE_t$), and μ_t is the stochastic error term. This equation focuses on the long-term relationship between the natural logarithm of total exports (TE) and its determinants, including trade openness (TO), foreign direct investment (FDI), and exchange rates (EXR). It provides insights into the sustained effects of these factors on total exports.

As a result, after obtaining the long run, the next step is to obtain the short run using an error correction model (ECM). The ARDL-ECM model can be stated as follows:

$$\Delta lnTE_t = \theta_0 + \theta_1 \Delta lnTE_t + \theta_2 \Delta lnTO_{t-1} + \theta_3 \Delta lnFDI_{t-1} + \theta_4 \Delta lnEXR_{t-1} + \delta ECM_{t-1} + \varepsilon_t \quad (3)$$

Where: θ_0 represents a constant term, θ_1, θ_2, θ_3, and θ_4 are coefficients representing the short-run dynamic effects, δ is the coefficient for the error correction term (ECM), ECM_{t-1} is the lagged error correction term, ε_t is the stochastic error term. The ECM term (δECM_{t-1}) measures the speed of adjustment in the short run, indicating how quickly the system corrects deviations from the long-run equilibrium. A negative sign for δ implies a correction towards equilibrium. The ARDL-ECM model explores short-run adjustments in total exports (TE) concerning its determinants. Changes in total exports are explained by short-term dynamics such as changes in trade openness (TO), foreign direct investment (FDI), exchange rates (EXR), and the error correction term (ECM). The error correction term captures the speed at which the system corrects deviations from the long-run equilibrium. In simpler terms, these equations help us understand how various factors impact total exports in both the short and long run, considering adjustments over time.

The coefficients θ_1, θ_2, θ_3, and θ_4 are the short-run dynamic coefficients of the model's convergence to equilibrium.

Furthermore, in this study, the Granger causality test is used to determine the direction of estimated causality between variables, as well as the existence of causality within the variables [Granger and Engle 1987]. The Granger causality test is conducted when two pairs of model variables have achieved co-integration and are stationary [Pesaran et al. 2001]. It is used to determine the direction of estimated causality between variables and the presence of causality within the variables. To determine the direction of causation and identify which variable acts as a predictor for another variable, the Granger causality Wald test is applied.

Table 2. Descriptive Statistics Outcome Summary

Variable	Observation	Mean	Std. Dev	Min	Max
LnTE	40	21.32583	1.129003	19.78986	22.99107
LnTO	40	12.64377	0.5119562	11.39519	13.2507
LnFDI	40	18.74243	2.296862	12.10071	21.46323
LnEXR	40	5.939875	1.798576	2.104134	7.741968

Source: Own elaboration.

Table 3. Unit Root Test Outcomes by ADF-test and PP at level

Level form	**Dickey-Fuller test**		**Phillips-Perron test**		**Conclusion**
Variables	**test statistics**	**critical value**	**test statistics**	**critical value**	
Total export (TE)	–3.288	–3.544	–3.217	–3.544	not stationary
Trade Openness (TO)	–1.284	–3.544	–1.824	–3.544	not stationary
FDI	–4.166	–3.544	–4.251	–3.544	stationary
Exchange rate	–0.857	–3.544	–1.009	–3.544	not stationary
After first difference					
Level form	**Dickey–Fuller test**		**Phillips–Perron test**		**Conclusion**
Variables	test statistics	critical value	test statistics	critical value	
Total export (TE)	–4.767	–3.548	–4.836	–3.548	stationary
Trade Openness (TO)	–4.973	–3.548	–4.990	–3.548	stationary
FDI	–11.772	–3.548	–12.410	–3.548	stationary
Exchange rate	–3.722	–3.548	–3.691	–3.548	stationary

Source: Own elaboration.

This is accomplished by testing and estimating the Vector Error Correction Model (VECM), where the significance or insignificance of the independent variable at any lag indicates the presence or absence of a causal relationship from that variable to the dependent variable.

RESULTS

The descriptive statistics results in Table 2 are based on a 40-year observation period that spans from 1980 to 2019. Based on the export performance (lnTE) as the targeted variable, the maximum value is 22.99107, the minimum value is 19.78986, the mean value is 21.32583, and the standard deviation is 1.129003. It can be concluded that the export performance dataset is closely centered around the mean. Trade openness (lnTO) has a maximum value of 13.2507, a minimum value of 11.39519, and a mean value of 12.64377, all of which are close to the mean. FDI has a maximum value of 21.46323 and a minimum value of 12.10071, with a mean value of 18.74243. The exchange rate (lnEXR) has a maximum value of 7.741968 and a minimum value of 2.104134, with a mean value of 5.939875. These values are all relatively close to the mean.

On the other hand, to avoid the issue of erroneous regression, the Dickey-Fuller Test and PP Test were specifically used to determine whether the variables have a unit root [Dickey and Fuller 1981]. The outcomes of the unit root tests, specifically the Dickey-Fuller test and the Phillips-Perron test, were analyzed to assess the stationarity of the variables in the study, as presented in Table 3. The results show that at the level form, the test statistics for "Total export" (TE), "Trade Openness" (TO), "FDI", and "Exchange rate" were observed to be –3.288, –1.284, –4.166, and –0.857, respectively – with a critical value of –3.544 for all variables. None of the variables met the criterion for stationarity at the level form, indicating that "Total export", "Trade Openness", "FDI", and "Exchange rate" were non-stationary in this context. However, after first differencing, the test statistics for "Total export", "Trade Openness", "FDI", and "Exchange rate" were observed to be –4.767, –4.973, –11.772, and –3.722, respectively, with a critical value of –3.548 for all variables. As a result, all variables achieved stationarity after first differencing, providing a suitable foundation for reliable time-series analysis in the study.

Another important step was the selection of the optimal lag, which comes after testing for unit stationary. The lagged observations may be observed in both de-

Table 4. Lag length Selection Order Criterion

Lag	LL	LR	df	P	FPE	AIC	HQIC	SBIC
0	37.3951				1.1e-07	–1.85115	–1.77445	–1.62896
1	144.516	214.24	25	0.000	1.0e-09	–6.54377	–6.08356	–5.21061*
2	177.235	65.438	25	0.000	7.1e-10*	–6.98484	–6.14113*	–4.54072
3	203.953	53.436	25	0.001	8.3e-10	–7.083*	–5.85579	–3.52792
4	228.087	48.269*	25	0.003	1.5e-09	–7.03356	–5.42284	–2.36751

Note: asterisk sign (*) indicates lag order selected by the criterion

Source: Own elaboration.

Table 5. Outcomes of ARDL Model Regression

lnTE	Coefficient	Std. Err	*T*	*P* >|t|	[95% Confidence Interval]	
lnTE						
L1.	0.6246592	0.1257865	4.97	0.000	0.3655971	0.8837213
L2.	0.1973698	0.1125668	1.75	0.092	–0.0344658	0.4292054
LnTO						
---	0.6681393	0.1250368	5.34	0.000	0.4106150	0.9256637
L1	–0.4697486	0.1226511	–3.83	0.001	–0.7223533	–0.2171439
LnFDI						
--	0.0094394	0.0163574	0.58	0.569	–0.0242492	0.0431280
L1.	0.0831708	0.0180024	4.62	0.000	0.0460942	0.1202473
L2.	–0.0458935	0.0255117	–1.80	0.084	–0.0984359	0.0066488
LnEXR						
--.	–0.1593041	0.2554223	–0.62	0.538	–0.6853563	0.3667480
L1	0.9098248	0.3130098	2.91	0.008	0.2651690	1.5544810
L2	–0.5747903	0.1811779	–3.17	0.004	–0.9479332	–0.2016474
Constant	0.0004146	0.08749319	0.00	1.000	–1.8015410	1.802371

Source: Own elaboration.

pendent and independent variables. The ideal lag length is chosen using the command "varsoc". Table 4 shows the outcomes of selecting the ideal lag length. The study established the appropriate lag length for the model to be estimated before moving on to test for cointegration. This is important because the chosen number of lags can significantly impact cointegration analysis. The test was run by allowing a linear deterministic trend in the data and using lag 1 for a differenced endogenous variable.

Table 4 displays the results for the ideal lag length of the ARDL model. Four lags – FPE, AIC, HQIC, and SBIC – were chosen. AIC recommends 3 lags, SBIC recommends 1 lag, and FPE and HQIC recommend 2 lags. As a result, the majority of the selection criteria recommend that the study have two lags in this regard.

The results for the ARDL model presented in Table 5 were obtained based on the maximum lag selection of 2.

Moreover, the results indicate that the overall outcomes of the model are statistically significant from zero.

The results in Table 5 show that the lnTE is statistically significant at lags one and two at 1% and 10% levels of significance. The lnTO is statistically significant at lag one at a 1% level of significance. The lnFDI is statistically significant at lags one and two at 1% and 10% levels of significance. Lastly, the lnEXR is statistically significant at lags one and two at a 5% level of significance. The constant in the model indicates a positive impact and represents variables that are not included in the model but still affect Tanzania's export performance.

To estimate the long-run relationship between these macroeconomic variables, the ARDL bound test was employed. The bound test is based on the alternative hypothesis, which states that variables co-integrate (have a long-run relationship). It is accepted if the *F*-value is higher than the critical values at I(1). The co-integration justifies the use of the Error Correction Model (ECM) and ARDL. Therefore, the results in Table 6 show that there is a co-integrated relationship between the variables, given that the *F*-value is 5.432, which is greater than the critical values. Thus, we proceeded to estimate the ECM and ARDL models.

Table 6. Smith/Shin/Pesaran (2000) ARDL Bound Test Result

Test Statistics	Value	Critical Values	
	5.432	**I(0)**	**I(1)**
F-test		2.45	3.52
		2.86	4.01
		3.25	4.49
		3.74	5.06

Source: Own elaboration.

Additionally, to determine whether there is short-run or long-run equilibrium among variables, the ARDL bound test for cointegration was used. The results show that the lnTE indicates that the coefficient of trade openness is statistically significant and has a positive effect on export performance (lnTE) in the long run, with a coefficient of 1.114736 at a 1% level of significance (Table 7). Furthermore, the coefficient of FDI is also statistically significant and has a positive effect on export performance in the long run, with a coefficient of 0.2624956 at a 5% level of significance. Lastly, the coefficient of exchange rate (lnEXR) is also statistically significant.

Table 7. Outcomes of ARDL bound test (Long run results)

Long run model coefficient		
Regressor	**Coefficient**	***P*-value**
Constant	0.0004146	1.000
LnTO	1.114736	0.008
LnFDI	0.2624956	0.049
LnEXR	0.98741	0.003

Source: Own elaboration.

Moreover, for the results presented in Table 8, in the short run, trade openness was found to have a positive sign (0.4697486) and was statistically significant at a 5% level of significance. FDI had a positive sign (0.0468935) and was statistically significant at a 10% level of significance. The exchange rate had a positive sign (0.5747903) and was statistically significant at a 1% level of significance. The Error Correction Mechanism (ECM) had a negative sign as expected (–0.177971). This indicates that the current year has adjusted for about 17% of the discrepancy from the previous year.

Table 8. Outcomes of ARDL bound test (Short run results)

Regressor	Coefficient	*P*-value
LnTO		
D1	0.4697486	0.001
LnFDI		
D1	–0.0372772	0.164
LD	0.0468935	0.084
LnEXR		
D1	–0.3350345	0.157
LD	0.5747903	0.004
ECM	–0.1779710	0.000

Source: Own elaboration.

As a result, both variables are statistically significant and have both long- and short-term effects. The results of the ARDL bound test for cointegration also demonstrate that there is cointegration between the variables. With a *P*-value of 0.000 and a value for the Durbin-Watson test, the test for ARDL for error

Table 9. Granger Causality Test Results (VECM)

Independent Variables	Dependent Variables				Direction of causality
	–0.1173183	0.1299629	1.040848	0.0860158	
	(0.472)	(0.538)	(0.472)	(0.466)	
	0.2399275*	–0.0760433	1.699654	–0.3068741**	TO TE, TO EXR
	(0.082)	(0.670)	(0.165)	(0.032)	
	–0.0173805	–0.0456064**	–0.6531577***	0.0734417***	FDI TO, FDI EXR
	(0.347)	(0.017)	(0.000)	(0.000)	
	0.2968853*	0.8441512***	–0.0444925	0.7495153***	EXR TE, EXR TO,
	(0.089)	(0.000)	(0.977)	(0.000)	
	–0.0971593***	–0.0361717	0.0253654	0.0610701***	
	(0.000)	(0.247)	(0.906)	(0.000)	
Constant	0.0601617	–0.953106	0.0772432	0.0071788	
	(0.269)	(0.236)	(0.792)	(0.764)	

Note: *, ** and *** = significant at 10, 5 and 1% respectively

Source: Own elaboration.

correction model regression also demonstrates that the model is stable (1.929962).

Moreover, to determine whether a relationship between variables used in the study has a long- or short-term impact, the study uses the vector error correction model (VECM), whose results are presented in Table 9. Starting with export performance for each equation, the findings demonstrate that the error correction term ECT (t-1) is statistically significant at a 1% level with a *P*-value of 0.000, indicating the presence of a long-run causal effect on export performance. Findings for short-term causal effects indicate that trade openness (TO) is statistically significant at a 10% level with a *P*-value of 0.082, suggesting that TO contributes to export performance (TE) in the short term. Results for the second TO equation indicate that the error correction term, ECT (t-1), is statistically insignificant, indicating that TO has no long-term causal effect. However, the short-term data demonstrate that foreign direct investment (FDI) causes TO significantly at a 5% level of significance (*P*-value = 0.017). Additionally, the exchange rate (EXR) causes export performance and is statistically significant at a 1% level with a *P*-value of 0.000. However, results for the third equation of FDI show that the error correction term ECT (t-1) is statistically insignificant, indicating that neither a long-term nor a short-term causal effect of FDI on export performance exists.

The results for the fourth equation indicate that the error correction term ECT (t-1) is statistically significant at a 1% level with a *P*-value of 0.000, suggesting the existence of a long-run causal effect in the EXR at a 1% level of significance. And for the short term, *P*-values of 0.002 and 0.000 demonstrate that TO and FDI cause EXR at a 1% level of significance. Certain variables, such as trade openness (TO) granger cause export performance (TE), exchange rate (EXR) granger cause export performance (TE), FDI granger cause trade openness (TO), and FDI granger cause exchange rate (EXR), show a unidirectional relationship in the direction of variables, while the exchange rate (EXR) to TO is discovered to have a bidirectional relationship.

On the other hand, the study conducted an analysis to assess the presence of serial correlation in the model using the Durbin-Watson test. The obtained Durbin-Watson d-statistic of (4, 39) = 1.929962 indicates that there is no significant serial correlation present in the model. Consequently, the model is considered free from the issue of serial correlation, as supported by the results presented in Table 10 for the Breusch and Godfrey LM test for autocorrelation, which yielded a *P*-value of (0.8388). Thus, the evidence suggests that the model does not exhibit significant serial correlation, reaffirming the reliability and validity of the results obtained from the analysis.

Table 10. Durbin-Watson test

Test statistic	*P*-Values	dL (Lower Critical Value)	dU (Upper Critical Value)
1.929962	0.01	1.142	1.524
	0.05	1.329	1.473

Source: Own elaboration.

Since the calculated d-statistic of 1.929962 in Table 10 falls within the range of the critical values (1.142 to 1.524 at the 0.01 significance level and 1.329 to 1.473 at the 0.05 significance level), it indicates that there is no significant serial correlation in the model. Thus, the study's results suggest that the model is free from the problem of serial correlation.

Table 11. Results for Breusch-Godfrey LM test for Auto correlation

Lags (p)	Chi^2	Df	Prob > Chi^2
1	0.041	1	0.8388

Ho: no serial correlation

Source: Own elaboration.

Additionally, for heteroscedasticity, the White test was performed, and the results clearly demonstrate that the model is statistically significant, indicating that there is no issue with heteroscedasticity, as shown in Table 11. The *P*-value of 0.0141 is lower than the 5% level of significance.

Table 12. Outcomes of White's Test

Chi^2 (9)	=	20.68
Prob > Chi^2	=	0.0141

Ho: Homoscedasticity; Ha: unrestricted heteroscedasticity

Source: Own elaboration.

Additionally, by taking into account the *P*-value of 0.0451 in the model, Cameron and Trivedi's Decomposition demonstrates that the model is free from heteroscedasticity. Tables 12 and 13 make this very evident.

Table 13. Outcomes of Cameron and Trivedi's Decomposition of LM-Test

Source	Chi^2	*df*	*P*
Heteroscedasticity	20.6	9	0.0141
Skewness	1.98	3	0.5775
Kurtosis	0.07	1	0.7980
Total	22.73	13	0.0451

Source: Own elaboration.

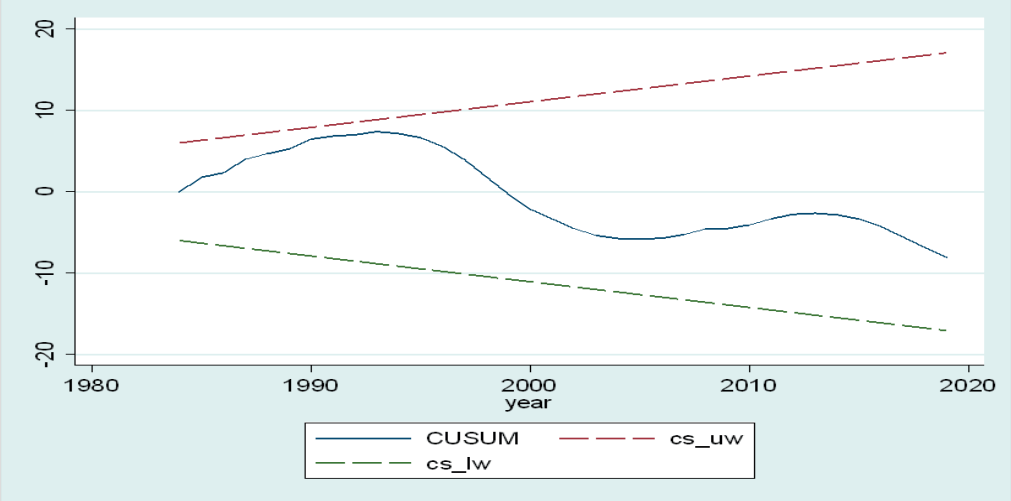

Fig. 3. Results for a CUSUM test

Source: Own elaboration.

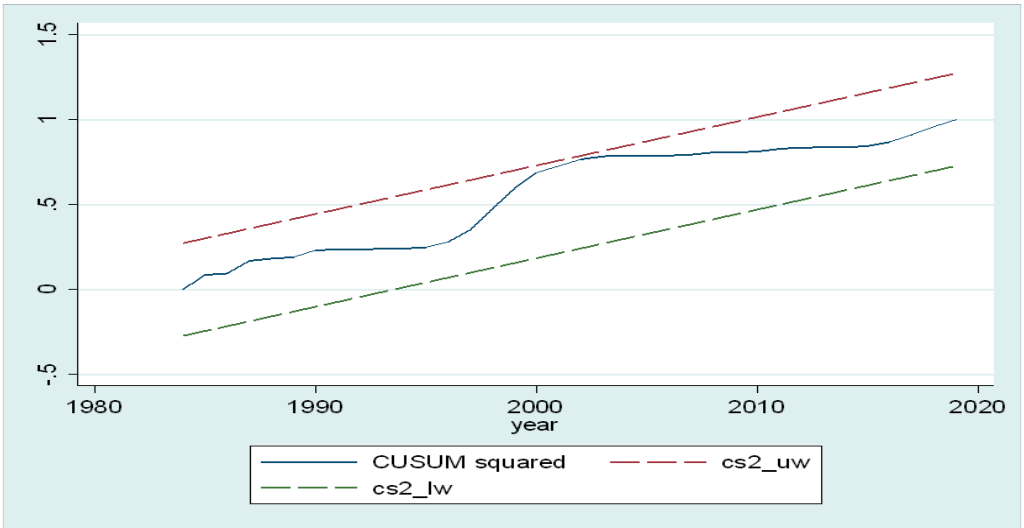

Fig. 4. Results for a CUSUM SQUARE test

Source: Own elaboration.

Generally, it is essential to ensure the stability, correct functional form specification, and avoidance of serial correlation and heteroscedasticity of the model in order to ensure the strength of the results. It is accurate to say that the Durbin Watson, Breusch-Godfrey, and LM tests are used to test for serial correlation, and Cameron and Trivedi's Decomposition of the LM test confirms the absence of serial correlation. The diagnostic test results indicate that there is neither serial correlation nor heteroscedasticity.

The model is stable, and there are no issues with functional specification, according to the findings of the model stability test. The CUSUM result shows that the models used in this study are stable at a 5% level of significance, as both the CUSUM (Fig. 3) and the CUSUM square (Fig. 4) fall within the 5% level of significance.

DISCUSSION

The findings of the study have shown that the F-statistics are higher than the critical value, and the results of the ARDL bound test show that there is a long-term relationship between export performance, trade openness, FDI, and the exchange rate. As a result, the results contradict the null hypothesis, according to which there is no correlation between export performance, trade openness, FDI, and the exchange rate.

The results of the ARDL bound test showed that export performance, trade openness, FDI, and the exchange rate all have a long-term relationship. The F--statistics is higher than the critical value. Consequently, the results contradict the null hypothesis, according to which there is no correlation between export performance, trade openness, FDI, and the exchange rate.

Trade openness, FDI, and the exchange rate all show positive trends over the long term and are statistically significant, which suggests that a 1% rise in any of these factors improves export performance. The long-run association finding is consistent with prior research such as Ismail and Lwesya [2021], Mohsen and Chua [2020], Hassan et al. [2016], and Ahmed et al. [2014], which found long-run links between export performance, trade openness, FDI, and the exchange rate.

All variables display positive signs in the short term as expected, while ECM also exhibits a negative sign as anticipated. Assuming other factors are constant, this suggests that factors are swiftly changing from the short run to the long run (equilibrium). At a 5% level of significance, the error term is statistically significant and has a negative sign (–0.177971). This outcome is consistent with those reported by Iheanacho [2017], Kingu [2014b], and Ahmed [2000]. The conclusion of a short-run association confirms the findings of past studies that export performance, trade openness, FDI, and the exchange rate exhibit long-run relationships [Chaudhry et al. 2010, Ahmed et al. 2014, Iheanacho 2016].

The VECM results in Table 9 demonstrate that there are both long- and short-term causal relationships between the variables, with trade openness having a 10% significance impact on both short- and long-term export performances. The exchange rate (EXR) and FDI both contribute to trade openness, with the former being statistically significant at a 5% level of significance with a *P*-value of 0.017 and the latter at a 1% level with *p*-values of 0.000. According to the FDI data, the error correction term ECT (t-1) is statistically negligible, suggesting that there is no short- or long-term causal effect on FDI. The findings of the fourth equation indicate that the error correction term ECT (t-1) is statistically significant at a 1% level with a *P*-value of 0.000, suggesting the existence of a long-run causal effect in the exchange rate at a 1% level of significance. The findings in Table 9 using VECM indicate a long-run and short-run causal relationship between variables. Specifically, trade openness causes export performance at a 10% level of significance in both the short run and long run. FDI also causes trade openness, and this relationship is statistically significant at a 5% level of significance with a *P*-value of 0.017. The exchange rate (EXR) has a causal effect on trade openness and is statistically significant at a 1% level with a *P*-value of 0.000.

The results for FDI indicate that the error correction term is statistically insignificant, suggesting no long-run causal effect of FDI and no short-run effect either. On the other hand, the results for the fourth equation show that the error correction term is statistically significant at a 1% level with *P*-values of 0.000, indicating the presence of a long-run causal effect of the exchange rate at a 1% level of significance.

Furthermore, the short-run data demonstrate that trade openness and FDI have a significant impact on the exchange rate at a 1% level of significance, with *P*-values of 0.002 and 0.000, respectively. These findings are supported by the granger causality results in Table 9, which suggest that the VECM model is appropriate. Moreover, the results from the VECM indicate a unidirectional causal relationship between the variables. Specifically, trade openness influences export performance but does not affect trade openness, FDI influences trade openness but does not affect FDI, and the exchange rate influences export performance but does not affect the exchange rate. However, there is a bidirectional causal relationship between trade openness and the exchange rate, with trade openness affecting the exchange rate and the exchange rate affecting trade openness. These findings are consistent with previous studies by Ratnaike [2012], Ghani [2011], Babatunde [2009], Malik [2007], Bashir [2003], and Ahmed [2000], which hypothesized both unidirectional and bidirectional causality between the variables.

The implementation of trade liberalization policies has led to a reduction in trade barriers, attracting investors from various nations. The empirical findings of the ARDL bound test also demonstrate that FDI has a positive and statistically significant impact in both the long and short term. Specifically, Tanzania's export performance increases by 4% in the short term and by 26% over the course of a year for every 1% increase in FDI. These findings align with previous studies by Ismail and Lwesya [2021], Iheanacho [2016], Manamba [2016], and Ahmed et al. [2014], which found a positive relationship between FDI, trade openness, and export performance. This suggests that as trade barriers are reduced, more investors, capital, and advanced technology are encouraged to invest, leading to the production of high-quality products that can be exported, thus boosting a country's export performance.

CONCLUSIONS

Using a time series analysis methodology, the primary objective of this study was to examine the impact of trade liberalization on Tanzania's export performance since its inception in 1980. The study's findings shed light on the intricate interplay between trade liberalization, foreign direct investment (FDI), exchange rates, and export performance in the context of Tanzania.

The analysis indicates a significant positive correlation between trade liberalization and subsequent export performance. Over time, trade liberalization has played a crucial role in facilitating a significant increase in export quantities. This has enabled businesses in Tanzania to effectively engage with global markets and exploit new opportunities. These findings underscore the importance of continuous government support for trade liberalization policies, which are essential for fostering economic growth and enhancing Tanzania's competitive edge in the global marketplace.

Furthermore, the research highlights the significant impact of FDI on export expansion. Increased FDI inflows not only facilitate the production of high-quality products but also attract both domestic and foreign buyers, stimulating export expansion. To maximize the potential benefits of FDI, the government must create an investor-friendly climate by liberalizing markets and implementing policies that provide incentives for both novice and diaspora investors. The establishment of Investment Promotion Agencies is considered a strategic measure to attract foreign investors and increase FDI inflows, fostering export sector expansion. Therefore, the government should finance these agencies to improve their performance and attract more foreign investors.

Additionally, the research demonstrates the interdependencies between trade liberalization and FDI strategies, emphasizing the need for effective collaboration between these two factors to optimize export outcomes. Trade liberalization is more effective when accompanied by complementary policies that support FDI. An integrated approach to these policies has the potential to spark investor interest, promoting sustainable export growth and Tanzania's economic development. The study revealed a reciprocal relationship between trade liberalization and exchange rates, emphasizing the importance of competent exchange rate management in enhancing export competitiveness. The government can stimulate export-driven growth in Tanzania by maintaining a favorable exchange rate, making Tanzanian exports more appealing to international buyers. To further support the expansion of export-oriented industries, policymakers must carefully consider exchange rate policies and ensure their alignment with trade liberalization efforts.

Based on empirical evidence, several practical recommendations can be made to policymakers, regulatory bodies, and entrepreneurs. To encourage the expansion of exports and economic diversification, policymakers need to prioritize and strengthen trade liberalization measures. Additionally, the government must create an environment that attracts foreign direct investment and facilitates the transfer of technology and knowledge. Investment promotion agencies, on the other hand, can significantly contribute to attracting foreign investors and establishing strategic partnerships, thus boosting export performance.

In conclusion, this study provides a comprehensive understanding of the positive effects of trade liberalization on Tanzania's export performance, underscoring the importance of collaboration among policymakers, regulatory bodies, and business owners. Tanzania has the potential to achieve consistent economic growth, enhance its export competitiveness, and establish a stable position in the global market through strategic utilization of trade liberalization and foreign direct investment (FDI).

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WPŁYW LIBERALIZACJI HANDLU NA WYNIKI SEKTORA EKSPORTOWEGO W TANZANII – ANALIZA SZEREGÓW CZASOWYCH 1980–2019

STRESZCZENIE

Cel: Celem artykułu jest lepsze zrozumienie konsekwencji liberalizacji handlu dla wyników eksportu Tanzanii. Ponieważ większość przeprowadzonych badań – niewielka liczba w krajach rozwijających się i część w krajach rozwiniętych – przyniosła mieszane wyniki, a relacje różnią się w zależności od kraju, niemożliwe jest udzielenie ostatecznej odpowiedzi na pytanie, czy liberalizacja handlu ma wpływ na sektor eksportowy Tanzanii bez uprzedniego przeprowadzenia analizy empirycznej. **Metody:** W badaniu zastosowano ilościowe metody badań, ponieważ pozwalają one na większą liczebność próby oraz lepszą obiektywność i dokładność. Ze względu na charakter badania i wykorzystane dane wybrano metodę badania statystycznego, w ramach którego uzyskano dane makroekonomiczne za lata 1980-2019 z Banku Światowego i Biura Statystycznego Tanzanii w celu analizy wpływu liberalizacji handlu na wyniki eksportu za pomocą wektorów korekcji błędów i autoregresyjnego rozproszonego opóźnienia. **Wyniki:** Przeprowadzone analizy ujawniają istotną dodatnią korelację pomiędzy liberalizacją handlu a wynikami eksportu oraz współzależności pomiędzy liberalizacją handlu a strategiami bezpośrednich inwestycji zagranicznych (BIZ). Istnieje wzajemna zależność pomiędzy liberalizacją handlu a kursami walutowymi, co wskazuje na znaczenie umiejętnego zarządzania kursami walutowymi w zwiększaniu konkurencyjności eksportu. **Wnioski:** Z badania wynika, że liberalizacja handlu, BIZ i wyniki eksportu wykazują pozytywną, długoterminową korelację. Skrupulatnie realizowana polityka liberalizacji handlu jest kluczowa nie tylko dla rozbudowy sektora przemysłu eksportowego i napływu kapitału, ale także dla transformacji i rozwoju narodu.

Słowa kluczowe: handel międzynarodowy, liberalizacja handlu, model wektorowej korekcji błędów (VECM), autoregresyjne rozproszone opóźnienie (ARDL), ekonomia międzynarodowa, wzrost gospodarczy