A Causal Relationship between Trade, Foreign Direct Investment, Exchange Rate and Economic Growth in Gambia

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Abstract

The study explores how trade, foreign direct investment (FDI), exchange rate and economic growth relate causally within the Gambia. It investigates the mutual effects over time analogs and explore into subterranean dynamics that drive socioeconomic progress over the period under study. The main objective of this study is to analyze the impact of trade, FDI and exchange rate on economic growth in Gambia. This investigation employs quantitative methodologies combined with econometric techniques drawn from a diverse range of time-series data sources; seeking crucial insights regarding interconnections among the macroeconomic variables of interest being: measurements reflecting GDP Growth, trade, exchange rate and FDI inflows. The study employed secondary time series data sourced from World Bank Website using OLS, Johansen's Cointegration, and Causality Analysis for 1980 to 2021 period. It unravels a significant outcome in which the independent variables have a positive impact on economic growth. There is no reciprocal causality relationship between the variables except a unidirectional causal relationship between exchange rate and GDP as well as FDI with direction from exchange rate to GDP and to FDI. The findings indicate that trade openness, attracting FDI, and maintaining exchange rate stability are crucial for promoting sustained economic growth in Gambia. Therefore, the government should engage in trade liberation, attract more FDI with a stable foreign currency exchange rate which will help enhance economic growth.

Keywords: Economic Growth, Trade, Foreign Direct Investment, Exchange rate, Causality, Gambia.

JEL Classifications: O11, F14, F21, F31, O55

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1. Introduction

The relationship between trade, foreign direct investment (FDI), exchange rates, and economic growth has become a topical issue in today's globalized world. The purpose of this study is to investigate the relationship between these macroeconomic variables and their impact on the economic growth of The Gambia in West Africa with trade been the variable of interest. The impact of these macroeconomics variables on economic growth has raised a great attention to many researchers in the international trade but none has been done specifically for Gambia. Various studies have been conducted however the literature still has the mixed bag of results.

Like many developing nations, Gambia struggles to achieve long-term economic growth and development in the face of a continually shifting global economic environment. Understanding the causal links between trade, foreign direct investment (FDI), exchange rate fluctuations, and economic growth is essential for formulating sound policies and making strategic decisions. These factors interact in a complicated way. Nevertheless, there is still a lack of empirical data regarding the precise causal pathways and their consequences for Gambia, which calls for a thorough examination to close this knowledge gap. However, the main objective of the study is to investigate the causal relationship between Gambia's economic growth, trade, foreign direct investment and exchange rate as well as evaluate the implications for policy formation and sustainable development.

In 2022, Gambia's economy resumed recovering more slowly due to a slowing global economy. Following a steep decline to 0.6 percent in 2020, real GDP grew by 4.3 percent (1.8 percent per capita) in 2022, unchanged from 2021, when economic growth was recovering from the COVID-19 pandemic. Better agricultural output, which profited from a comparatively wet season, fueled growth on the supply side. The negative economic performance of Gambia can be explained by a slowdown in the expansion of the industry and a muted rise in the services sector. Since the nation is a net importer of food and energy and has seen negative terms of trade, rising global commodity prices and trade disruptions have negatively impacted the economy.

Growing costs and a shortage of building and manufacturing materials impacted industrial growth. A weaker-than-expected recovery in tourism was associated with weak service growth; even though arrivals increased, this recovery was insufficient to counteract sluggish growth in other subsectors. Increased infrastructure spending and public consumption propelled demand expansion on the demand side, whereas private consumption declined and exports shrank. Due to the knock-on consequences of Russia's invasion of Ukraine, economic growth was 1.3 percentage points lower than earlier estimates.

Trade, volatility in exchange rates and foreign direct investment (FDI) are important macroeconomic variables determining its economic development. For decision-makers, investors and companies looking for business prospects in Gambia's market, understanding the causal links between these variables can offer insightful information. Also, we can get insights into the mechanisms that

form Gambia's economy by evaluating the connection between trade, FDI, exchange rates and economic growth.

Gambia has difficulties in its path to economic growth through trade, FDI and exchange rate control. The country's development has been hampered by lack of infrastructure, regulations and external shocks. However, Gambian government's dedication to diversification, investment promotion and economic reforms has resulted in some noteworthy successes.

Trade policy has a substantial impact on a country's economic growth McNab and Moore (1998); Raihan (2023). It refers to a government's set of laws, regulations and agreements that control foreign commerce activity. These policies have a direct impact on a country's economic development and can influence a variety of economic factors. However, the government has been working to raise the standard of living for its people through pursuing economic development. The nation has experienced numerous difficulties throughout the years, but it has also made substantial efforts to support sustainable economic growth.

One of the main industries promoting economic growth is agriculture, which also employs a sizeable section of the population and makes a substantial contribution to both export revenue and food security Rafael (2023); Zhuang et al. (2022). The nation understood the value of expanding its economy beyond agriculture. Given that the nation is home to stunning beaches, a vibrant cultural history and a wide variety of species, the tourist industry has been one of the key drivers of economic growth. Infrastructure for tourism and marketing tactics have been improved and the hotel sector has received numerous training.

Additionally, efforts have been undertaken to improve the business environment and encourage entrepreneurship. The administration has also tried to improve governance, openness and accountability in order to foster economic development. The encouragement of foreign direct investment (FDI) is another area of emphasis for economic development in the Gambia. Policies have been put in place by the government to draw in foreign capital, notably in industries like manufacturing, services and infrastructure. New technology, employment possibilities and capital inflows could result from these investments, which would promote economic growth and development.

Trade is critical for a country's development particularly in underdeveloped countries. It enables developing countries to expand their markets outside their own borders Laboni et al. (2023); Brenton et al. (2022). Countries with better institutions and those that trade more rapidly grow. Countries with stronger institutions trade more and through international commerce, these countries have access to wider consumer bases, resulting in higher sales, production and economic growth. Trade fosters economic activity and offers job possibilities by facilitating the movement of commodities, services and investments.

Developing countries frequently lack the resources, technology or skills required for development Davison et al. (2000); Heeks (2002); Nguyen and Nielsen (2023). They can import these resources and technologies from other countries thanks to trade. They can also acquire access to cash, machinery, raw materials and knowledge through trade, which can be used to boost production and efficiency. A country's reliance on a small number of sectors or goods might leave it vulnerable to economic shocks. Trade allows emerging countries to diversify their economy by growing into new sectors and markets Dathe et al. (2023). Countries can lessen the risks associated with reliance on a single industry or product by diversifying their export base.

By exporting goods and services, developing countries can earn foreign currency. These foreign currency revenues can be utilized to purchase necessities such as machinery, technology and investments. Foreign exchange inflows increase a country's financial position, improve its ability to import required goods and contribute to overall economic stability. Through commerce, developing countries are exposed to new ideas, expertise and innovations from throughout the world. This promotes learning and assists emerging countries in upgrading their sectors, increasing production and promoting innovation.

Trade has the potential to significantly reduce poverty in emerging countries. It helps to improve living standards and overall well-being by encouraging economic growth and offering access to a broader choice of commodities and services. Increased commerce can provide revenue for individuals and households, as well as pull people out of poverty Zhang et al. (2023). It is worth highlighting that in order to fully reap the benefits of trade, developing countries should work on growing capacity, expanding infrastructure, cultivating a friendly business environment and implementing proper trade regulations.

Gambia should actively explore and capitalize on chances for market entry. This can be accomplished through bilateral and international trade treaties, preferential trade agreements and membership in regional economic communities. Access to larger markets, such as the Economic Community of West African States (ECOWAS) or the African Continental Free Trade Area (AfCFTA), can help it diversify its exports.

Its competitiveness can be improved by encouraging value addition and processing within the country. Rather than merely exporting raw materials, the government may invest in processing sectors to manufacture higher-value-added items. Processing agricultural items such as fruits, vegetables and nuts for example, might contribute to increased export revenues and job development.

2. Literature Review

In an era of globalization, the intricate relationship between trade, foreign direct investment (FDI), exchange rates and economic growth has become a paramount importance for policymakers, economists and scholars alike. This article investigates into the causal relationship that exists between these macroeconomics variables, with a specific focus on Gambia. The study investigates the

potential channels through which trade influences it's economic performance regarding market access and liberations and how it can contribute to the existing literature, informing policy and providing valuable insights into the complex relationships between the variables of interest. By examining time series historical data trends and empirical research evidence, the study aims to provide a comprehensive understanding of how trade dynamics, FDI inflows, exchange rate movements and economic growth interact and influence each other for the Gambia economy. However, the literature presented in this study is organized into three main parts. This includes conceptual clarification, theoretical and empirical framework.

2.1 Conceptual Clarification

Trade, FDI, exchange rates and economic growth all have intricate and intertwined causal linkages. Trade growth can draw foreign direct investment (FDI), which can result in technology transfer and export diversification. Also, the increase in investors' confidence and a sustainable economic growth can both be attributed to a stable exchange rate over time. The Gambia case serves as an example of how these variables might be strategically aligned to amplifier up favorable economic effects.

Trading is a dynamic and growing landscape defined by growth opportunities that promote regional and economic cooperation. Domestic trade occurs within a country whereas international or foreign trade occurs between countries. The exchange of products and services can occur through various channels including direct barter where goods are transferred without money and monetary transactions which include currencies. Trade is critical to the global economy because it drives economic growth, promotes specialization and fosters interdependence among states. It enables countries to capitalize on their comparative advantages and produce goods more efficiently in order to access a range of products at competitive rates. Trade has long been acknowledged as a driving force behind economic expansion and advancement. Because of its advantageous location on the Atlantic coast, Gambia has always relied heavily on trade to power its economy. The trade sector in Gambia has been anchored by the export of agricultural goods like cashews and groundnuts. A more robust trading environment has emerged in recent years as a result of the diversification of exports to include textiles and fisheries Sambou and Ceesay (2023). In December 2022, Gambia had a trade deficit which stems from the country's weak export position. Re-exports account for more than 80% of overall exports. The country is a net importer of petroleum and food. It's largest trading partners are China, the United Kingdom and India.

By injecting capital, technology and talent into recipient countries, foreign direct investment is crucial in promoting economic progress Wang et al. (2023). Gambia has actively sought out FDI as a way to quicken its development. Significant FDI inflows have been drawn to industries like tourism, agriculture and manufacturing, fostering job growth and advancing industrialization initiatives. FDI has a variety of effects on economic expansion. Not only does it support capital production, but it also fosters the transfer of knowledge and technology Khan (2023). Partnerships with international

investors can help domestic businesses become more competitive and capable. The example for Gambia shows that FDI can act as a catalyst for crucial sector diversification and modernization, fitting with its long-term development goals.

Exchange rates, or how much one currency is worth in respect to another, are crucial in determining the direction of flows of both commerce and capital abroad. Exchange rate fluctuations have a big impact on how much imports cost, how competitive exports are and how appealing FDI is in Gambia setting. For sustained economic growth, an exchange rate system that is competitive and stable is essential. Volatility in exchange rates can have both good and negative effects Akbar (2023). While a currency's decline can make exports more competitive, it also makes imports more expensive, which could result in trade imbalances Odionye et al. (2023). The efforts of Gambia government to preserve exchange rate stability through responsible monetary policies help to create a climate that is favorable for long-term economic growth.

According to World Bank estimates, Gambia's GDP (Gross Domestic Product) is worth 2.27 billion US dollars in 2022 despite this number representing 0% of the global economy. The GDP increased by 5.20 percent in the fourth quarter of 2022 compared to the same quarter the previous year. The GDP Annual Growth Rate averaged to 3.74 percent from 1968 to 2022, with a peak of 12.39 percent in 1975 and a low of -8.10 percent in 2011. Agriculture is the most important sector of the economy; crops and cattle support 75 percent of the population. Gambia's economy has been steadily rising in recent years as a result of tourism development, remittance inflows and re-exports. And the government is attempting to maintain the rate of expansion by implementing policies aimed at modernizing agriculture.

2.2 Theoretical Framework

Indeed, the Ricardian Comparative Advantage theory and the Heckscher-Ohlin Factor Endowment theory are foundational theories in international trade and have significantly influenced the understanding of trade relations and their impact on countries' economic growth. Both theories provide insights into how countries can benefit from trade by specializing in producing goods for which they have a comparative advantage or based on their factor endowments. These theories have been foundational in shaping trade policies, understanding trade patterns and analyzing globalization's implications on economic growth, income distribution and development strategies.

Thus, the free trade model has powerful insights into why unrestricted trade is beneficial by showing that all countries can engage in mutual exchange and specialization under unrestricted trade. Free trade emerges as an integral part of the modern economic policy through fostering comparative advantage, enhancing consumer welfare, helping to promote economic growth and a means of contributing to peace and stability at a global level. The potential of nations collectively can be unlocked by embracing the principles of free trade to create prosperity, innovation and shared progress at a global scale.

The relationship between trade and labor in third world countries is complex and can be influence by many factors, including specialization, market access and some policy frameworks Krueger (1984). Contrary to the notion that trade may lead to stagnant wages and inequality, the evidence suggests that developing countries with abundant labor supply can experience rising wages and improved living standards through strategic engagement in global trade. By leveraging their comparative advantages, embracing technological advancements and implementing supportive policies, developing countries can harness the transformative power of trade to foster inclusive growth, enhance prosperity and create opportunities for their burgeoning populations.

The World Trade Organization (WTO) reports that the amount of global merchandise trade increased by roughly 10.8% in 2010 following a decrease in 2009 as a result of the global financial crisis. Even though there were some ups and downs in the following years such as COVID-19, the overall trade volumes were growing at varying rates. Although they are often insignificant than trade growth rates, global GDP growth rates have been positive over the years. For example, in the post-crisis period, the average annual growth rate of the global GDP was between 3 and 4 percent, which was lower than pre-crisis levels.

It is worth noting that in the theoretical growth literature, the correlation between trade policies and economic growth has received greater attention than the relationship between trade volumes and economic growth. Although trade integration is frequently considered to be a major determinant of economic growth, there is conflicting scientific data to support this claim Romer (1990). Economic integration may have a negative impact on particular countries if trading partners resides in asymmetric countries, whereby they have significant and dissimilar technology and resources Young (1991). The static benefits of trade and the costs of trade restrictions have been widely addressed in the theory of international trade. However, trade theory does not offer much guidance regarding how international commerce affects economic growth and technological advancement.

2.3 Empirical Framework

There are few empirical studies on trade, FDI inflows and exchange rates or essential macroeconomic variables on economic growth in Gambia. And also lack of consensus due to different time periods and methodologies pose a challenge for adequate literature for the study. The astounding variations in growth rates across Africa, particularly Sub-Saharan Africa, during the past few decades have reignited interest on how trade policies affect growth. While many East Asian nations that implemented export-promotion policies consistently outperformed other nations, developing countries in Africa that used Import substitution industrialization (ISI) strategies saw comparatively lower growth rates. This likely explains why, since the late 1970s, an expanding amount of empirical and theoretical study has switched to examining the connection between trade liberalization and the economic performance of nations Yanikkaya (2003).

Economic growth and trade expansion have a favorable link, according to empirical studies. By exposing domestic industries to competition, opening up economies to international commerce

encourages innovation, efficiency and productivity improvements Rahim et al. (2023). Greater integration into international markets has been made possible by Gambia government's attempts to liberalize trade and enhance trade infrastructure, supporting its objectives for economic growth Wan et al. (2023).

The research on the relationship between trade, FDI, exchange rate and economic growth generally finds a favorable association between the four variables. However, only a small number of studies provide clear evidence linking the four variables. Under the open-door policy, economic growth, trade and FDI are mutually reinforcing. The literature on FDI, trade and economic growth generally indicates a favorable trade and FDI-growth link. Relatively, few studies directly test the three variables' causality. Economic growth may induce FDI inflows. Trade and FDI also stimulate economic growth. This study adds to the body of knowledge by investigating the existence and nature of these causal linkages. The current research focuses on Gambia, where FDI growth has been most prominent recently.

Dritsaki et al. (2004) using secondary data examines the relationship between trade, foreign direct investment (FDI) and Greece's economic growth from 1960 to 2002. There cointegration results reveals a long-run equilibrium and a causal relationship between the variables under investigation, based on the Granger causality test results likewise. Thus, they concluded that under the open-door policy, trade, foreign direct investment and economic growth seem to be mutually reinforcing. Similarly, Jayachandran and Seilan (2010) investigates the relationship between Trade, Foreign Direct Investment (FDI) and economic growth for India over the period 1970-2007. Their Cointegration results analysis suggested that there is a long-run equilibrium relationship. Also, the results of Granger causality test showed that there is a causal relationship between the examined variables.

Meerza and Imran (2012) analyzed empirically the causal relationship between trade, foreign direct investment (FDI) and Bangladesh's economic growth from 1973 to 2008. They employed the Johansen cointegration test and the Granger causality test to evaluate the data. The cointegration analysis indicates that the variables have a long-term equilibrium connection. Furthermore, the Granger causality test findings show a causal relationship between the variables indicated. They concluded that Bangladesh's economic growth drives both FDI and export growth and that there is a unidirectional causal relationship between FDI and export, with export driving FDI.

Similarly, there is evidence of a causal relationship between trade, foreign direct investment (FDI), exchange rate and economic growth. Studies have found that FDI has a positive relationship with economic growth, indicating that an increase in FDI leads to a rise in economic growth Dritsaki et al. (2004); Nya'akunat Elisha-Hosea Batat (2021). Additionally, trade has been shown to have a significant positive relationship with economic growth, meaning that an increase in exports leads to a rise in economic growth Alper and Alper (2019); Amadou Maiga et al. (2019); Runtunuwu (2020). However, the relationship between FDI and trade is unidirectional, with trade influencing FDI but

not vice versa. The role of the exchange rate in this relationship is also explored, with one study finding that FDI has a positive relationship with economic growth at maximum levels of the exchange rate. Overall, these findings suggest that trade and FDI play important roles in promoting economic growth and policymakers should design policies to attract FDI and promote exports.

There is a causal relationship between trade, foreign direct investment (FDI), exchange rate and economic growth in Gambia. Imports and exports have a bidirectional relationship with economic growth, indicating that they are sources of economic growth in the country Bouznit and Aïssaoui (2023). FDI inflows have a negative impact on income in the short-run but a positive impact in the long-run, indicating that the net impact of FDI on aggregate income depends on the degree of complementarity and substitution between FDI inflows and domestic investment Ceesay et al. (2019). Therefore, trade, FDI, exchange rate and economic growth are interconnected in Gambia, with imports, exports and exchange rate playing a role in economic growth and FDI having both short-run and long-run effects on income Ndimballan et al. (2019). However, Babaji et al. (2016) examines nexus between macroeconomic variables and FDI inflows in India. Using Autoregressive Distributed Lag (ARDL) testing approach to co-integration and Toda Yamamoto Granger Causality test. They found that there is bi-directional causality and a long-run association between GDP and FDI inflows. The causality test validated a causal relationship between FDI and most economic variables.

The Gambia has evidence of a causal relationship between trade, FDI, the exchange rate and economic growth. Trade has a bidirectional causal link with economic growth, implying that it contributes to the country's economic progress. Furthermore, the exchange rate also positively affects economic growth. On the other hand, FDI does not generate economic growth, implying that changes in economic growth do not explain changes in FDI. These findings emphasize the significance of trade, FDI and the exchange rate as important macroeconomic variables driving economic growth.

3. Methodology and Data

3.1 Model and Data

The study examined the effect of trade, foreign direct investment (FDI), exchange rates on economic growth in Gambia using annual time series secondary data sourced from the World Bank website. The information spans the years 1980 through 2021. Time series data set helps the researchers to understand the behavior of the variables over time. Also, Ordinary Least Squares (OLS) approach has been adopted to estimate the regression equations.

3.2 Model Specification and Variable Definitions

The study objective is to analyze the impact of trade, foreign direct investment (FDI), exchange rates on economic growth in Gambia. A multiple linear regression model was applied in the study and to account for the time series' proliferative effect, all data are expressed in logarithms and denoted by the letter L at the start of each variable. Real GDP is used to measure economic growth, FDI is used to measure foreign direct investment inflows, official exchange rates are used to measure

exchange rate and real export revenues are used to measure trade for period under review. The ε signifies the error term which represents factors other than trade, FDI and EXR that affect GDP. While $\alpha_{\circ}$ and β_1, $\beta2$, $\beta3$ represent the intercepts, and the slope or coefficient of regression respectively.

The model necessitates instituting a coefficient for regression of the data and also doing the interpretations of population. In case of GDP, trade, FDI, inflation and exchange rate, the linear regression equation for this regression model can be express as illustrated below.

$$GDP = f\ (TRADE, FDI, EXR) \tag{1}$$

$$GDP = \alpha_{\circ} + \beta_1 TRADE + \beta_2 FDI + \beta_3 EXR + \varepsilon \tag{2}$$

The vector autoregressive model (VAR) approach is used in this study to determine the causal relationship between economic growth, trade, foreign direct investment inflows and exchange rates in the Gambia. The model has the following form:

$$GDP = f\ (TRADE, FDI, EXR) \tag{3}$$

$$TRADE = f\ (GDP, FDI, EXR) \tag{4}$$

$$FDI = f\ (TRADE, GDP, EXR) \tag{5}$$

$$EXR = f\ (TRADE, FDI, GDP) \tag{6}$$

Several econometrics tests are used to analyze the data in other to avoid spurious results. We start by making sure the variables include unit roots. The Augmented Dickey-Fuller (ADF) test is used to verify the existence of the unit root. Following the unit root test, the study continued with the confirmatory Kwatkowski-Phillips-Schmidt-Shin (KPSS) test. We then move on to (i) choose an initial model specification; (ii) examine the order in which the variables are integrated; (iii) look for co-integration relationships; and (iv) use the Granger causality test.

You can choose a model with a constant term, a trend term, a drift term, or a mix of any of these for the model specification. In order to choose the best model, information criteria are applied. The model offering the information criteria's minimum value is chosen. According to the informational requirements, the variables have a constant value and a trend. The findings of the next two information criteria are used to determine how many lags should be considered in the model. The p (which refers to the number of lags being considered) will be used to determine the Schwartz Information Criterion (SIC) and Akaike Information Criterion (AIC) respectively.

In order to prevent erroneous regression, we began the lag length selection by incorporating a maximum of 4 lags. We then compared the recommendations of the two-information criterion for the number of lags to be included. As SIC offered the lowest value, it was chosen. The SIC indicates that 1 lag should be included in the model (p=1). The Augmented Dickey-Fuller (ADF) unit root test and

the Kwatkowski-Philips-Schmidt-Shin (KPSS) stationary test are used to identify the order of the variables' integration. The test hypothesis and the ADF test equation are shown below:

$$\Delta y_t = \beta_1 + \beta_2 y_{t-1} + \sum_{i=1}^{p} \alpha i \Delta y_{t-1} + \varepsilon_t \tag{7}$$

Null hypothesis (H0)

Ho: $\beta_2 = 0$

Alternative Hypothesis (H1)

H1: $\beta_2 < 0$ \hfill (8)

Where y_t equal GDP, TRADE, FDI, EXR.

The test hypothesis is described along with the Kwatkowski-Philips-Schmidt-Shin (KPSS) stationary test equation below:

$y_t = \xi_t + \varepsilon_t$ with ξ_t = random walk and $\varepsilon_t \sim I(0)$

Ho : $\sigma_{\varepsilon}^2 = 0$

H1 : $\sigma_{\varepsilon}^2 > 0$ \hfill (9)

In this research, we employ Johansen's approaches for the co-integration relation testing. A test for co-integration of multiple integrated order one I(1) time series data is called the Johansen test. The Johansen test has an advantage over other co-integration tests in that it can handle several time series variables while other co-integration tests can only handle a single cointegration connection. Trace and maximum Eigen value tests are the two types of tests used in the Johansen test. To find co-integration linkages, the maximum Eigen value tests and the trace test are applied. AIC and SIC, two information criteria, are taken into consideration when choosing the lag of the variables. The following equation represents the Johansen co-integration test:

$$y_t = \mu + A_1 y_{t-1} + \cdots + A_p y_{t-1} + \varepsilon_t \tag{10}$$

Where y is nx1 (n x1) vector that are integrated of order 1 or commonly written as

I (1) and ε_t is nx1 vector of innovations. Equation can be rewritten as:

$$\Delta y_t - \mu + \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma i \Delta y_{t-1} + \varepsilon_t \tag{11}$$

Where:

$$\Pi - \sum_{i=1}^{p} Ai - I \text{ and } \Gamma_i - \sum_{j-i-1}^{p} Aj \tag{12}$$

Granger causality tests can be used to determine whether the study's variables, which include GDP, trade, FDI, and exchange rate, have any precedence relationships. AIC and SIC are two information criteria that are used to determine how many lags should be considered during the estimating process. The test hypothesis and the Granger causality test equation are shown below:

$$y_t = \beta_o + \beta_1 t + \sum_{i=1}^{k} \gamma i y_{t-1} {}_+ \sum_{j=1}^{k} \sigma i X_t^-{}_j + \varepsilon_t \tag{13}$$

$$X_t = \beta_o + \beta_1 t + \sum_{i=1}^{k} \gamma i x_{t-1} {}_+ \sum_{j=1}^{k} \sigma i y_{t-j} + \mu_t \tag{14}$$

H_o : " X does not Granger cause Y"

H_1 : "Y does not Granger cause X"

Where y_t and x_t equals GDP, TRADE, FDI AND EXR

4. Results and Discussion

Table 1 shows the descriptive statistics of the variables. These statistics offer insights into the central tendency, variability, distribution shape and other characteristics of the variables. There is a broad spread in GDP values indicating a significant variation around the mean. There's a wide range in trade values, as evident from the difference between the minimum and maximum values. The FDI values are quite high relative to the mean, indicating significant variability in its values. The data ranges from a minimum of 1.72 to a maximum of 51.50. The standard deviation is 15.97, which indicates a wide dispersion of exchange rate values. Based on the analyses, the TRADE variable appears to be the most normally distributed among the four. The other variables show varying degrees of deviation from normality. Table 1 shows the descriptive statistics of the variables.

Table 1. Descriptive Statistics

	GDP	TRADE	FDI	EXCHANGE_RATE
Mean	9.07E+08	1.96E+08	40328462	20.91491
Median	8.09E+08	2.04E+08	29590000	14.23739
Maximum	2.04E+09	3.63E+08	2.52E+08	51.50166
Minimum	1.77E+08	57527743	-1990000	1.720983
Std. Dev.	5.43E+08	76172545	49713459	15.96794
Skewness	0.227679	0.043557	2.468493	0.574997
Kurtosis	1.901265	2.640685	10.39499	1.999562
Jarque-Bera	2.475497	0.239219	138.3544	4.065885
Probability	0.290036	0.887267	0.000000	0.130950
Sum	3.81E+10	8.25E+09	1.69E+09	878.4260
Sum Sq. Dev.	1.21E+19	2.38E+17	1.01E+17	10453.98
Observations	42	42	42	42

4.1 Multiple Regression Analysis

The regression result indicated that 93% of the dependent variable in the model can be explained by the independent variables (R^2 = 0.930028). The regression line indicated that there was a significant and positive relationship between the independent variables and the dependent variable. This is shown on table 2 below:

Table 2. Multiple Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.29E+08	65546042	-1.962390	0.0571
TRADE	3.201601	0.399454	8.014947	0.0000
FDI	4.279177	0.774320	5.526366	0.0000
EXCHANGE_RATE	11206816	2854676.	3.925775	0.0004
R-squared	0.930028	Mean dependent var		9.07E+08
Adjusted R-squared	0.924504	S.D. dependent var		5.43E+08
S.E. of regression	1.49E+08	Akaike info criterion		40.57001
Sum squared resid	8.46E+17	Schwarz criterion		40.73551
Log likelihood	-847.9703	Hannan-Quinn criter.		40.63067
F-statistic	168.3591	Durbin-Watson stat		0.698733
Prob(F-statistic)	0.000000			

4.2 Unit root and stationary tests

The Augmented Dickey-Fuller (ADF) test aids in identifying trends that hinder a series from being stable over time. This is an important step since non-stationary data might result in erroneous correlations and incorrect results in econometric analysis. The test result is given in Table 3. The ADF test null hypothesis is stated as follow: H_o:(Series has unit root).

Table 3. Unit root ADF test result

Variables		level ADF test statistic		First differences ADF test statistic
	k		k	
		p-values		p-value
GDP	0	2.17009 (0.9705)	0	-6.006234* (0.0000)
trade	1	2.961816 (0.0473)	1	-5.961050* (0.0000)
FDI	0	1.406917 (0.9987)	0	-5.699451* (0.0000)
EXR	1	0.119859 (0.9634)	0	-4.076980* (0.0028)

The test equation for level series comprises a constant without a trend. The test is run at a 5% threshold of significance. The test equation for the first-difference series has a constant without trend. The test is run at a 5% threshold of significance. The minimum SIC chooses the lag length (k), with a maximum lag of one. In the parenthesis is the p-value. The ADF test denotes that the null hypothesis is rejected at the 5% significance level.

The ADF unit root test findings show that for all the variables at the series level, the null hypothesis cannot be rejected at a 5% level of significance. However, the first differences in the series show that the null hypothesis is rejected at 5% significance level for all the variables. As a result, all variables have been integrated to order one, or I(1).

Following the Augmented Dickey-Fuller (ADF) test, the variables under study are subjected to a confirmatory Kwiatkowski-Philips-Schmidt-Shin (KPSS) stationary test. The following is the KPSS test's null hypothesis: H_o: (series is stationary). The columns labeled "1% CV", "5% CV", and "10% CV" represent the critical values (CV) for the test at the 1%, 5%, and 10% significance levels, respectively.

The KPSS stationary test result is given in Table 4.

		Level					First difference	
Variables								
		1%	5%	10%			5%	10%
	KPSS_stat.	CV	CV	CV	KPSS_stat.	1% CV	CV	CV
GDP	0.775090*	0.739	0.463	0.347	0.127216**	0.739	0.463	0.347
Trade	0.685260*	0.739	0.463	0.347	0.399406**	0.739	0.463	0.347
FDI	0.802731*	0.739	0.463	0.347	0.366708**	0.739	0.463	0.347
EXR	0.771785*	0.739	0.463	0.347	0.199199**	0.739	0.463	0.347

Table 4: KPSS test result

The test equation includes constants but no trend for all the variables at series level and for the first differences in the series. At the 5% level of significance, the null hypothesis is rejected since the series is stationary. ** means that the null hypothesis was not rejected at the 5% level of significance, whereas * indicates that the null hypothesis was rejected. The series is hence stagnant.

The KPSS stationary test results show that, for the four variables employed in the study at the series level, the null hypothesis "series is stationary" is rejected at a 5% significance level. However, at a 5% level of significance for all the variables at the series' initial differences, the null hypothesis "series is stationary" is accepted. As a result, the first discrepancies between the four variables employed in the study are stationary. The KPSS stationary tests support the results of the Augmented Dickey-Fuller (ADF) test. In light of this, all the four series (GDP, Trade, FDI and EXR) are non-stationary at their level but turn stationary in their first differences. It is discovered that the four variables employed in the study are integrated to order one, or I(1).

4.3 Co-integration test

The Johansen co-integration test is an accurate integration test given that it has been determined that all four of the study's variables are integrated of order one. The trace and the maximum Eigen value tests are both parts of the Johansen co-integration test. The null hypothesis of the test is stated as follow: H_o: (No cointegrating equation). The Johansen co-integration test result is given in Table 5a and 5b below

Table 5a. Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.534524	53.24738	47.85613	0.0143
At most 1	0.320536	22.65963	29.79707	0.2632
At most 2	0.121757	7.201608	15.49471	0.5543
At most 3	0.048968	2.008309	3.841466	0.1564

Table 5b. Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.534524	30.58776	27.58434	0.0199
At most 1	0.320536	15.45802	21.13162	0.2581
At most 2	0.121757	5.193299	14.26460	0.7173
At most 3	0.048968	2.008309	3.841466	0.1564

Performing a cointegration test is necessary to establish a long run relationship. The test is conducted at level series and the test equation includes constants without trends. Co-integrating equation not present at the 5% level, rejecting the null hypothesis. The smallest SIC chooses the lag length (p), with the maximum lag being 1. Johansen co-integration test results: trace test CV at series level: 5% level (47.85613); eigen value test CV at series level: 5% level (27.58434) show that the null hypothesis is rejected at the 5% level of significance. Thus, the series are cointegrated and they exhibit a long run relationship.

In table 6 below, the test statistic is obtained by dividing the coefficient value to the standard error) with GDP used as dependent variable. The null hypothesis of "no co-integrating equation" is rejected at the 5% level of significance since the trace statistic and maximum eigenvalue statistic are greater than the 5% Critical value. A co-integration equation is shown by the test at a 5% level of significance. There is consequently a long-term relationship between the factors. In the long run, trade, FDI and Exchange rates will have a positive effect on economic growth. The coefficients are generally found to be statistically significant at the 5% level, ceteris paribus. Co-integration is assumed, but the null hypothesis is rejected. As a result, the model contains a co-integrating relationship.

Table 6. Normalized cointegrating coefficients (standard error in parentheses)

GDP	TRADE	FDI	EXR
1.000000	-4.169806	-2.770197	-17901713
	(0.49404)	(1.78515)	(3913789)

4.4 Granger causality test

To investigate the Granger causal relationships between the variables under investigation, the Granger causality test was applied. Table 7 shows the findings about the existence of Granger causal relationships between economic growth, trade, FDI and exchange rates. The test is conducted at level series with a lag of one. There is a unidirectional causal relationship between exchange rate and GDP as well as FDI with direction from exchange rate to GDP and to FDI. Thus, we do not reject the null hypothesis for the Granger causality test for the rest outcomes since their p-values are greater than 5% significance value.

Table 7. Granger causality test

Null Hypothesis:	Obs	F-Statistic	Prob.
TRADE does not Granger Cause GDP_ECONOMIC_GROWTH	41	0.38586	0.5382
GDP_ECONOMIC_GROWTH does not Granger Cause TRADE		0.40145	0.5301
FDI does not Granger Cause GDP_ECONOMIC_GROWTH	41	3.65972	0.0633
GDP_ECONOMIC_GROWTH does not Granger Cause FDI		0.80420	0.3755
EXCHANGE_RATE does not Granger Cause GDP_ECONOMIC_GROWTH	41	11.7767	**0.0015**
GDP_ECONOMIC_GROWTH does not Granger Cause EXCHANGE_RATE		0.04220	0.8383
FDI does not Granger Cause TRADE	41	0.08903	0.7670
TRADE does not Granger Cause FDI		0.21225	0.6476
EXCHANGE_RATE does not Granger Cause TRADE	41	0.24105	0.6263
TRADE does not Granger Cause EXCHANGE_RATE		0.64964	0.4253
EXCHANGE_RATE does not Granger Cause FDI	41	5.41237	**0.0254**
FDI does not Granger Cause EXCHANGE_RATE		0.41608	0.5228

5. Conclusion and Recommendations

Using annual data for the years 1980 to 2021, the study examines the relationship between economic growth (GDP), trade, FDI and exchange rates. According to the empirical analysis, every variable employed in this study has a unit root. On this base, a long-run equilibrium relationship between these variables had been established using the Johansen cointegration test technique. Trade, FDI and exchange rates, the three independent variables in this model all have a positive correlation with economic growth. There is no reciprocal causality relationship between these variables except a unidirectional causal relationship between exchange rate and GDP as well as FDI with direction from exchange rate to GDP and to FDI.

Therefore, the major policy implication is to focus on enhancing productivity through increasing human capital and removing inefficiencies as well as other policies oriented towards economic growth such as monetary policy which includes interest rate management and money supply control. For the fiscal policy, the government should invest in infrastructure, education, healthcare and technology which can boost productivity and create jobs. They should lower taxes especially for businesses and individuals. This will encourage spending and entrepreneurship investment. Removing trade barriers such as tariffs and quotas can enhance international trade leading to increased economic activity and growth as well as perform export promotion hence encouraging domestic industries to export can boost production and employment. This will lead to GDP growth which will stimulate trade growth and will also attract FDI. The findings suggest that the Gambia capacity to progress on economic development will depend on her performance in attracting FDI.

Further analysis reveals more granular details regarding the speed with which adjustments occur during deviations from baseline values highlighting key drivers behind dynamic shifts within the economy. It is hypothesized that adjustments occur fastest for trade, FDI and exchange rate compared to economic growth rates underscoring how crucial enhancing those three macroeconomic variables can be while driving positive long-term impacts on overall development levels in developing economies such as Gambia. These findings' significance aligns with helping formulate strategies to promote higher levels of sustainable development through boosting relevant driving factors viz: trade, exchange rate and FDI.

These findings imply that an increase in trade transactions and FDI will have a beneficial impact on the country's economic growth thus, it can be suggested that officials in Gambia create a business-friendly environment and ensure political stability in order to attract foreign investors which could boost the country's economic growth potential. Future studies should incorporate more independent variables, such as market size, inflation rate, pay rate and human capital in order to arrive at a more definitive conclusion.

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