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Implications of Free Trade Area for Poverty, Household Welfare And Economic Development In Nigeria

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Abstract: The purpose of this study is to examine the implications of free trade areas on poverty, household welfare, and economic development in Nigeria. Using a fully modified ordinary least squares (FMOLS) regression technique, the study analyzes key macroeconomic indicators, specifically income per capita to measure welfare and unemployment to assess poverty. Historical data covering 27 years were sourced from the Central Bank of Nigeria's statistical bulletin to support the analysis. The findings indicate that export contributions to gross domestic product (GDP) and foreign direct investment (FDI) positively impact household welfare, as reflected in the increase in income per capita. Furthermore, both FDI and export contributions to GDP were found to have a negative relationship with unemployment, suggesting that participation in free trade areas can help reduce unemployment in Nigeria. The study concludes that engaging in free trade areas is likely to enhance household welfare and decrease poverty through reduced unemployment. These results have significant implications for policymakers, academics, researchers, and government officials. The study suggests that policies aimed at promoting FDI, increasing export contributions, and supporting GDP growth—such as tariff reductions, simplified trade regulations, increased credit availability for exporters, and the creation of duty drawbacks—can effectively improve household welfare, reduce poverty, and foster economic development in Nigeria.

Keywords: Free trade area, Income Per Capita, Poverty, Unemployment, Welfare, World Bank, Nigeria

JEL Classification: F1, F2, F4, F6.

1. Introduction

Eradicating poverty, promoting household welfare, and fostering economic development remain dominant objectives and major concerns for governments, particularly in developing nations such as Nigeria. The economies of most countries in the African region are plagued by these challenges, necessitating that their governments continually formulate policies aimed at reorganizing their political, economic, and social institutions to enhance welfare and drive economic development (Obomeghie & Ugbomhe, 2021).

Despite these extensive policy efforts, poverty indices in most African countries continue to fall below the global poverty line. Per capita income across African nations remains alarmingly low, reflecting poor living standards, inadequate hygiene, and low nutritional intake. The situation is exacerbated by weak institutional transformations that hinder various sectors' competitive performance in the global trade arena (Obomeghie & Ugbomhe, 2021). Nigeria is not exempt from these challenges, as evidenced by its recent per capita income of USD 1,809 and a total GDP of USD 2,450 billion (Central Bank of Nigeria [CBN], 2017). Many Nigerians lack basic amenities such as adequate housing, clean water, and sufficient nutrition. Additionally, the healthcare system is precarious, with access to healthcare being highly cumbersome. Infrastructural deficiencies, such as dangerous roads, further undermine the economy by impeding effective transportation.

The unreliable electricity supply continues to frustrate the industrial sector, adversely affecting the economy's competitiveness. Fiscal policies, particularly taxation, further limit the competitiveness of industrial sectors, especially small and medium enterprises (SMEs), thereby negatively impacting overall economic well-being (Abubakar & Obansa, 2020). High-interest rates remain a significant constraint for investors, limiting investment activities and entrepreneurial endeavors. This, in turn, hinders active participation in manufacturing—a key indicator of an economy's competitive strength. For a nation with a weak domestic economy, eradicating poverty, improving household welfare, and achieving overall economic growth is a formidable challenge.

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Recently, several African countries have recognized the potential of establishing free trade areas as a universal remedy for revitalizing struggling economies. These initiatives often involve the abolition or relaxation of trade restrictions among member countries, with the aim of lifting nations out of poverty, enhancing household welfare, and driving economic development across the continent (Abubakar & Obansa, 2020; Puzenat et al., 2010).

However, Nigeria presents a unique case. Despite its abundant natural and human resources, its trade with other countries, hindered by numerous restrictions, has not yielded significant progress in alleviating poverty, improving well-being, or fostering economic development. Therefore, it is imperative to explore the implications of ratifying a free trade agreement within the African continent on the Nigerian economy, particularly given its competitive strength, which stands at approximately 47.0 %—ranking it 16th among 44 African economies (Gap, 2017). This low performance index raises concerns about Nigeria's prospects in leveraging a free trade area to escape abject poverty, improve household well-being, and boost economic development.

Previous studies, such as those by Omoke and Busari (2008), have employed computable general equilibrium (CGE) models to assess the impact of trade policy reforms on rural poverty in Nigeria. Their findings indicated that trade liberalization led to a reduction in real wages and incomes, as well as further deterioration of rural inequality. However, their model did not explicitly capture the relationships between income per capita and key indicators such as foreign direct investment and export contributions to GDP. Similarly, Balogun and Dauda (2012) explored the impact of trade liberalization on poverty and employment in Nigeria using econometric analysis. Their results documented adverse relationships between disaggregated per capita incomes (industrial and agricultural sectors), total labor force, and trade liberalization, as represented by terms of trade, exchange rate, foreign reserves, domestic price index, and trade openness.

To bridge this gap, the present study seeks to evaluate Nigeria's preparedness to optimally participate in continental free trade, with the goal of alleviating poverty, promoting household welfare, and stimulating economic development. The study employs an ordinary regression method to determine the relationship between poverty—measured by household income per capita—and key determinants such as export contributions to growth, foreign direct investment, and gross domestic product.

2. Literature Review

Free trade encompasses sub-regional, regional, and continental trade agreements that facilitate the exchange of goods and services among nations by reducing or eliminating trade barriers. Proponents of free trade, such as Moroney and Walker (1966), Ricardo (1956), and Krugman (1993), argue that trade among nations fosters economic growth and prosperity by leveraging the principles of absolute and comparative advantage, as well as New Trade Theory. The primary objective of free trade is to enhance resource efficiency and create a competitive production base. The efficiency of resource allocation is grounded in the notion that labor-abundant countries produce labor-intensive goods to exchange for capital-intensive goods. Over time, competition for a superior position in the international market is expected to drive developing countries like Nigeria to adopt and develop new technologies. These developments are crucial for creating linkages that generate employment, increase income, and reduce poverty prevalence.

The benefits of trade can extend to the poor if the prices of the commodities they consume decrease while the prices of the goods they produce increase (Bank, 2018). This can alter relative prices in both product and factor markets, ultimately impacting the national economy by lowering the cost of products that are not domestically available at reasonable prices and improving the quality and variety of economic consumption in the marketplace. The pursuit of trade liberalization policies is often linked to sustained economic growth, as evidenced by growth accelerations following trade reforms in countries such as Taiwan (1962), Brazil (1967), China (1991), India (1991), and Poland (1991) (Irwin, 2019). Nigeria’s Economic Recovery and Growth Plan (ERGP) for 2017–2021 aims to achieve sustainable growth by focusing on industrialization, export orientation, and enhanced economic competitiveness. This shift has become imperative as Nigeria and other African countries continue to lag behind in global market performance due to low levels of industrialization. With a more outward trade orientation, the Nigerian economy is expected to increase national income and reduce poverty incidence (Ahmad, 2021).

The dismantling of trade restrictions across Africa is believed to benefit Nigerian manufacturing (Ihua, Ike-Muonso, Taiwo, & Mba-Kalu, 2018). The AITCR report emphasizes the need for economic integration as a strategy for economic transformation and sustainable socio-economic development in Africa. The strategy aims to aggregate Africa’s small economies into one large market, thereby delivering economies of scale, improved competitiveness, and increased foreign investments, which could contribute to poverty reduction in the region. In line with this strategy, African leaders and policymakers have made concerted efforts to establish an economic community, culminating in the 2017 agreement to establish the African Continental Free Trade Area (AfCFTA)

2.1. Conceptual Clarifications Of Free Trade Area

A free trade area is a common trade bloc among sub-regional, regional, or continental partners where all forms of trade restrictions are removed, leading to the establishment of customs unions that adopt common trade policies within the regional economic community (Grossman & Krueger, 1995). Sub-regional and regional trade blocs are often the precursors to continental integration. Nigeria, for instance, is a member of the Economic Community of West African States (ECOWAS) and applies an average tariff of 5.60% on imports from member trading blocs

(Ihua et al., 2018). However, trade among African countries continues to face high barriers, with average protection levels at 8.7% (Mevel & Karingi, 2012). According to Ma and Lu (2011), the principle of comparative advantage demonstrates that, on a global scale, free trade leads to higher levels of output and income than a state of autarky.

2.2. Poverty

Poverty is a condition in which individuals or groups of people lack or have limited access to the means of livelihood. In some cases, those identified as poor have a very limited understanding of the necessities for living, let alone possessing such resources. Poverty is often defined in relation to families that do not have sufficient cash income to meet the minimum requirements for food, shelter, and clothing (Atkinson et al., 1989; Khālid, 2003). According to Obomeghie and Ugbomhe (2021), poverty can be conceptualized in three fundamental ways: first, as a material condition where the income level of individuals is too limited to cover basic living needs; second, as a multidimensional condition where poverty is context-specific, dynamic, and influenced by social, political, and economic factors; and third, as a social relationship concerning gender, labor, and land, which prevents individuals from improving their living conditions.

In Nigeria, poverty is so pervasive that education, generally seen as a means to improve employability, increase income, and ultimately reduce poverty, has failed to fulfill these roles. Poverty manifests among graduates who have been unemployed for many years, private-sector workers who are paid far below their marginal productivity, and those who have lost their farmlands due to herdsmen/farmer conflicts or Boko Haram terrorism, leading them to become internally displaced persons (IDPs) in various states. Poverty is also evident in the slums and shanties of suburbs and satellite towns of major Nigerian cities, as well as in rural villages where people lack access to basic amenities and may not have the capital to scale up their farming and trading activities. These individuals often spend most of their earnings on food, leaving little capacity to save for further investment.

Ajakaiye and Adeyeye (n.d.) describe poverty as a situation that affects an individual's physical, moral, and psychological state, resulting from insufficient income to meet basic needs. This means that individuals are unable to adequately provide for basic needs such as food, clothing, and shelter. Additionally, individuals in poverty often lack the ability to meet social and economic obligations due to the lack of gainful employment, skills, assets, and self-esteem, as well as limited access to social and economic infrastructure such as education, health care, potable water, and sanitation (Obomeghie & Ugbomhe, 2021).

2.3. Economic Development

Sen (1999) defined economic development as the enhancement of autonomy and substantive freedom, enabling individuals to fully participate in economic life. It can also be understood as a situation that empowers individuals to explore all necessary opportunities, develop their capacities, and actively engage in the nation’s economic activities (M. Feldman, Hadjimichael, Lanahan, & Kemeny, 2016). A significant challenge to Nigeria's economic development is the limited economic participation of the labor force. This issue underscores the distinction between economic growth and economic development; periods of economic prosperity in Nigeria often fail to translate into poverty reduction, economic transformation, job creation, and sustainability. True economic development involves alleviating deprivation caused by poverty, hunger, illiteracy, illness, poor health, powerlessness, voicelessness, insecurity, humiliation, and difficulties in accessing basic infrastructure (Narayan, Patel, Schafft, Rademacher, & Koch-Schulte, 2000).

According to V. Feldman and Kothari (2014), economic development involves positioning a nation on a higher growth trajectory. This includes structural transformation, knowledge development, transfer, and infrastructure improvement, all of which can be achieved through efficient interactions between the public and private sectors. A free trade area (FTA) entails the reduction or elimination of both tariff and non-tariff barriers that hinder optimal performance, particularly in developing countries within the international market. As noted by UNCTAD (2014), agricultural exports from less developed countries face an average tariff of 5 % and non-tariff trade restrictiveness of 27 %. These non-tariff barriers include sanitary and phytosanitary measures as well as technical standards, which increasingly restrict export flows from less developed nations. An FTA facilitates a high degree of trade openness, promoting international trade among member countries.

According to the Bank (2018), trade is expected to positively impact the well-being of a nation’s economy and contribute to poverty reduction. Rapid and sustained economic growth offers the poor opportunities to increase their initial endowments by saving to accumulate capital, obtaining education to enhance human capital, and earning better rewards for supplying their resources. Nigeria cannot fully develop its resources without integrating into regional and continental trade agreements that establish an FTA. Regional integration is essential for economic transformation and sustainable socio-economic development in Africa (Ihua et al., 2018). For Africa to optimize its resource endowments and translate them into welfare gains for its growing population, regional integration is imperative (Ihua et al., 2018).

Bank (2018) further argues that trade liberalization leads to welfare gains through consumer surpluses, as consumers gain access to a greater variety of products in domestic markets and benefit from reduced import costs. Nigeria imports critical consumer and producer goods, and the existence of a common market between trading partners reduces the cost of production and consumption of final goods, which translates into welfare gains and poverty reduction.

Trade also promotes specialization, which is essential for the development of every nation's economy, including Nigeria. According to Finlayson et al. (2019), after trade liberalization, countries tend to specialize in the production of goods in which they have a comparative advantage relative to their trade partners. This specialization can raise output, as it allows for better and more efficient use of productive resources. The benefits of an FTA are crucial to Nigeria's economic development. However, efforts should be made to create a conducive environment for both domestic and foreign private investment through diversification and capacity building, thereby enhancing innovation and competitiveness within the domestic economy. Reducing trade barriers will not benefit all African countries equally; welfare gains will be more significant in countries with the most open economies (Finlayson et al., 2019).

2.4. Empirical Literature Review

Free The concept of free trade areas (FTAs) has been widely studied, with empirical research documenting its significant contributions to economic growth and poverty reduction, although findings have been mixed. Mohler, Weder, and Wyss (2018) examined the relationship between international trade and unemployment in Switzerland using panel data from 1991 to 2014. They employed linear probability models (OLS) and logit models and found no positive relationship between import competition and employment among low-skilled individuals. In contrast, Tanyi (2015) analyzed the benefits and unexploited trade potentials of African regional markets using an augmented multi-linear gravity model regression analysis. His study revealed that significant gains could be realized from the establishment of a Pan-African continental free trade area.

Brassington et al. (2015) explored regional integration and the reduction of intra-African trade barriers using a simulation approach. Their findings suggested that tariff elimination within intra-African trade is promising, though they concluded that a free trade agreement with selected African countries would be the second-best option. Similarly, Hummels (2007) estimated the effects of tariff removal on intra-African trade among African countries using the CGE (computable general equilibrium) model. His study projected that the share of intra-African trade would increase from 10.2 % in 2011 to 15.5 % by 2022. Kabir (2017) identified a negative inverse relationship between trade liberalization and price incentives, which theoretically should stimulate domestic production. However, Kabir noted that, in the long run, the simulation of full trade liberalization could increase global real income by 0.33 % after ten years of implementation, with middle-income countries receiving 0.5 % of the gains and the least developed countries receiving 0.8 %.

Abrego, Amado, Gursoy, Nicholls, and Perez-Saiz (2019) estimated the welfare effects of African continental free trade areas across 45 countries using a multi-country and multi-sector general equilibrium model. Their study concluded that partial and substantial reductions in non-tariff barriers would result in significant gains from trade liberalization in Africa.

Kim, Kundu, Viollet, and Guan (2011) estimated the effects of international trade on unemployment using panel data from twenty OECD countries. They discovered that increased trade leads to higher aggregate unemployment due to its interaction with rigid labor market institutions. However, they also posited that trade could reduce unemployment if labor market institutions are flexible, concluding that labor market rigidities act as a counterforce to employment creation through international trade. Fugazza and Miklósi (2014) analyzed policy issues and simulated discussions related to international trade and development. Their study used panel data from 97 countries covering the period from 1995 to 2009 to assess the relationship between trade openness and unemployment. The authors found that the effect of international trade on unemployment could be either positive or negative, depending on the covariance direction between comparative advantage and sector-level labor market functions within the economy.

In a related study, de Jong and de Steur (2016) investigated the relationship between international trade regulation and job creation. Using correlation analysis, they examined the relationship between labor force participation and export plus import data as a %age of gross domestic product from 1990 to 2012. They concluded that trade policy has minimal impact on unemployment, further noting that the effects of trade policy vary from one country to another.

3. Methodology

3.1. Theoretical Framework

In examining the implications of regional integrations or free trade areas, theorists such as Hamanaka (2013) have employed the computable general equilibrium (CGE) model and the gravity model to analyze the effects of trade agreements. The CGE model is primarily focused on studying the welfare effects of trade agreements—whether they involve free or partial trade restrictions—among countries. According to Rumpf et al. (2010), the CGE model is significant for determining the implications of free trade, as it aligns with the microeconomic theoretical framework and produces quantitative results that enable policymakers to identify beneficiaries and those disadvantaged by a free trade area or agreement. Proponents of the CGE model have documented the potential for studying welfare implications through various measures such as compensating variations, factor returns (wages, rents, profits, and interest), trade volumes (aggregated or disaggregated), imports, exports, changes in trade balances, and impacts on dynamic variables like capital flows, foreign direct investments, productivity spillovers, and economies of scale/imperfect competition.

On the other hand, the gravity model, as discussed by Rumpf et al. (2010), focuses on the ex-post effects of trade flows. This model is particularly suitable for assessing the implications of trade flows in scenarios where a free trade area agreement has not yet been implemented, thereby guiding policymakers in decision-making related to such agreements. Hamanaka (2013) is considered a pioneer of the gravity model, where bilateral trade between two countries is compared. This model determines import demands by using several explanatory variables, including the income of both importing and exporting countries, per capita income of the countries involved, distances between the countries, and other relevant variables as determined by the modeller (Plumer et al., 2010). Consequently, this study finds the gravity model to be an appropriate theoretical framework for measuring the implications of a free trade area. The stability of the gravity equation and its ability to explain bilateral trade flows have led to the development of theories that can be incorporated into models for forecasting the effects of trade flows.

The econometric form of the gravity model is represented as follows:

The econometric form of the gravity model is represented as :

$$LnExp_{ijt} = \alpha_j + \gamma_j + \lambda_t + \beta_1 lnY_{it} + \beta_2 lnY_{jt} + \beta_3 DIST_{ij} + \ldots + \mu_{ijt} \text{ ---------- (1)}$$

Where:

$\mathbf{Exp_{ijt}}$ is the volume of trade (exports) from country i to country j at time t

$\mathbf{Y_{it}}$ is the gross domestic product (GDP) in the country I at time *t*, and the same is for $\mathbf{Y_{jt\ for\ country\ j.}}$

$\mathbf{DIST_{ij}}$ is the distance between the countries i and j

i = 1, … N, j=1… i-1, i+1,…, N+1

3.2. Data

This study employed time series data covering a period of 27 years (1991 to 2017). Data related to per capita income (PCI), export contribution to gross domestic product (EXPGDP), gross domestic product (GDP), unemployment rate (UNR), and foreign direct investment (FDI) were sourced from the Central Bank of Nigeria's statistical bulletin of 2018.

3.3. Method

To explore the implications of a free trade area for poverty, both descriptive (mean, standard deviation, skewness, and kurtosis) and inferential approaches (fully modified ordinary least squares [FMOLS]) were used. These techniques were employed to determine the implications of a free trade area on welfare and poverty levels within an economy.

3.4. Specifications Of Models

To achieve the objectives of this study, the Tinbergen (1962) gravity model was modified along with empirical propositions to specify two models: one for welfare and the other for poverty, proxied by per capita income and unemployment, respectively. The variables considered incisive based on empirical evidence were export contributions to gross domestic product, foreign direct investment, and per capita income of individuals, as well as the unemployment rate (Sabina & Eldin, 2018). Rumpf et al. (2010) included tariff rates and domestic investment as determinants of real gross domestic per capita in their model to assess the implications of trade activities on welfare. Kim et al. (2011) also modeled the effects of trade on unemployment among 20 OECD countries.

The implications of a free trade area on poverty, as measured by per capita income (PCI) or the average income earned per person in a given country during a specified year, constitute an important index. This index allows for the comparison of income derived from various sectors of the economy, such as exports and foreign direct investment, as well as the wealth of different populations. The incorporation of these indexes in the study helps ascertain the level of development and readiness of a country like Nigeria to engage in a free trade area agreement. However, differences in countries' purchasing power parity, inflation rates, income distribution skewness, and non-monetary activities may affect the significance of per capita income as a measure of the implications of a free trade area for poverty. Despite these drawbacks, per capita income remains a superior index for measuring the standard of living in a given society.

Based on the theoretical framework, the functional and econometric relationships of the models are stated as follows::

$$\text{Welfare} = f(\text{Free trade area}) \text{ ---------- (2)}$$

Where:

Welfare is proxied by Per capita income as the outcome variable.

The free trade area is represented by export contributions to gross domestic product (EXPGDP), foreign direct investment (FDI) and gross domestic product (GDP) as the explanatory variables. On this basis equation 2 is re-specified as thus:

$$Welfare(PCI) = f(FDI, EXPGDP, GDP) \text{ ---------- } (3)$$

Where:

- PCI is the per capita income, which measures household welfare as a result of participation in trade. Per capita income is deemed an important measure of welfare because it reflects the living standards or well-being of individual households (Hossain, Kamal, Halim, & Zayed, 2019).
- FDI is foreign direct investment, which measures the impact of growth in per capita income to determine the policy implications of signing into a free trade area agreement. FDI is important because it contributes to a country's trade balance and impacts household welfare by improving incomes (Hossain et al., 2019).
- EXPGDP is the export contribution to gross domestic product, used to measure the impact of trade activities on the growth in per capita income and household welfare. This is to determine the implications of free trade area policies, such as those under the African Continental Free Trade Area (AfCFTA) that Nigeria has signed onto.
- GDP is the gross domestic product, which measures the overall performance of an economy. It is employed to determine the indirect impact of trade on household welfare through per capita income. This aligns with Paul (2010), who studied the relationship between gross domestic product and welfare in Denmark.

The variables in this study were selected to measure the degree of household welfare implications of trade under existing trade restrictions policies and to determine the potential benefits under non-restrictive trade policies among African countries.

Equation 1 implies that per capita income (PCI) is a function of export contributions to gross domestic product (EXPGDP), foreign direct investment (FDI), and gross domestic product (GDP), consistent with the findings of Sabina & Eldin (2018) and Abrego, Amado, Gursoy, Nicholls, & Perez-Saiz (2019).

To permit empirical analysis, equation 2 is formulated econometrically as thus:

$$Welfare = \alpha_0 + \alpha_1 EXPGDP + \alpha_2 FDI + \alpha_3 GDP + e \text{ ---------- } (4)$$

Where:

e is the error term assumed to be normally distributed with zero and constant variance. It is employed to capture the effect of implications of free trade area for poverty that could not be captured by the parameters of the explanatory variables in the model.

A priori, $\alpha_1, \alpha_2, \alpha_3$, are to be greater than zero. To determine the poverty implications of the free trade area, the following equation is specified thus:

$$\text{Poverty} = f(\text{free trade area}) \text{ ---------- } (5)$$

This implies that poverty is a function of the free trade area. For estimation purposes, poverty is proxied by the unemployment rate as the dependent variable, with the free trade area represented by foreign direct investment (FDI) and export contributions to gross domestic product (EXPGDP). Thus, equation 5 is re-specified as follows:

$$Poverty(UNR) = f(FDI + EXPGDP) \text{ ---------- } (6)$$

Where:

- Poverty is the outcome variable, measuring the implications of a free trade area on poverty, proxied by the unemployment rate. This approach aligns with studies by Kim (2011), Mohler, Weder, and Wyss (2018), who examined the poverty implications of free trade areas using unemployment as the outcome variable.
- PCI is per capita income, which in Tinbergen's (1962) gravity model is used as a proxy for gross domestic product but is modified here as per capita income.
- EXPGDP is the contribution of export proceeds to the gross domestic product.
- FDI is foreign direct investment, as described in the preceding paragraph, used as an explanatory variable to measure the implications of a free trade area on poverty, proxied by unemployment under existing restrictive trade policies.

To give econometric content to equation 6, it was reformulated thus:

$$Poverty(UNR) = \beta 0 + \beta 1 FDI + \beta 2 EXGDP + \mu \text{ ---------- } (7)$$

Where:

- μ is the error term, assumed to be normally distributed with zero mean and constant variance. Other explanatory variables remain as defined in equation 6.

The parameters in model 7 viz; β1, and β2 are expected to have an inverse relationship with the dependent variable (unemployment rate [UNR]), which is proxied for poverty to indicate the implications of a free trade area on employment.

This study adopts a step-by-step approach to estimate the final variables:

Step 1: A preliminary investigation of the stochastic properties of the variables, particularly normality assumptions, using normality tests (Skewness, Kurtosis, and Jarque-Bera).

Step 2: The determination of stationarity of the variables using the Augmented Dickey-Fuller (ADF) unit root test, complemented by the Phillips-Perron test. This step ensures that the data are stationary, preventing spurious estimates. The series was tested for stationarity at level I(0), integrated to order 0. However, it was found that stationarity was not achieved at a level for most series, so the data were subjected to first differencing (I(I)), where stationarity was established.

Step 3: Estimation of the coefficients of the variables using the fully modified ordinary least squares (FMOLS) method after establishing stationarity at the first difference for all variables.

4. Results And Discussion

4.1. Presentation Of Results

Table 1 presents the summary of descriptive statistics, showing that the means and median values of the respective variables are nearly identical, demonstrating even distribution, except for the PCI and GDP series. The deviation from the means, as depicted by the standard deviation, indicates that the unemployment rate (UNR) had the lowest standard deviation, followed by foreign direct investment (FDI) and export contributions to gross domestic product (EXPGDP). Income per capita (PCI) exhibited the highest standard deviation, followed by gross domestic product (GDP). The standard deviation values for each variable are lower than their respective mean values, indicating low volatility in the series.

The skewness results reveal that EXPGDP is negatively skewed with a long left tail, while PCI, UNR, and GDP are positively skewed with right tails. The kurtosis results show that PCI (1.7), EXPGDP (2.7), FDI (2.2), and GDP (2.0) are all below the kurtosis value of 3.0, indicating that these variables have a platykurtic distribution, which is flatter than a normal distribution. In contrast, a kurtosis value of 6.8 for UNR indicates a leptokurtic distribution, which is more peaked than a normal distribution. The large values of the Jarque-Bera test for normality suggest that errors are not normally distributed among the variables, except for EXPGDP, which has a J-B value close to zero (0.2).

Table 1: Descriptive Statistics

	PCI	EXPGDP	FDI	GDP	UNR
Mean	1377.296	22.44852	3.49296	203.2859	4.07370
Median	1008.000	23.02000	2.01000	104.9100	3.95000
Maximum	3223.000	36.02000	8.84000	568.5000.	6.24000
Minimum	270.000	9.22000	0.09000	27.7500	3.42000
Std. Dev.	970.322	6.45966	2.65127	178.2900	0.69129
Skewness	0.4381	-0.11606	0.65658	0.69094	2.164247
Kurtosis	1.6950	2.71658	2.16053	1.98180	6.82553
Jarque-Bera	2.77957	0.150986	2.73275	3.31459	37.54187
Probability	0.249128	0.92729	0.25509	0.190653	0.00000

Source: Author's computations.

To determine whether or not the data were stationary, the Augmented Dickey-Fuller (ADF), Phillip-Perron(PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were employed. The results of the unit root test among the variables in the study are presented in Tables 2 and 3.

Table 2: Summary of ADF Unit Root Test Results

Variable	Level	Prob.Value	First difference	Prob. Value	Order of Integration
PCI	-0.80334	0.4297	-3.229881*	0.003	I(1)
EXPGDP	-2.960235	0.006	-6.549474*	0.001	I(1)
FDI	-1.499815	0.1467	-5.970008*	0.001	I(1)
GDP	-0.304799	0.7631	-2.636033**	0.014	I(1)
UNR	-3.215202	0.0040	-3.902205*	0.001	I(1)
Asymptotic	Critical Values				
1%					
5%	-3.711457		-3.724070		
10%	-2.981038		-2.986225		
	-2.629906		-2.632604		

* implies significant at 1% level and ** significant at 5% level

Table 2 shows the Augmented Dickey-Fuller test results for the stationarity of the variable series. The results revealed that, at the level, two variables—export contribution to gross domestic product (EXPGDP) and the unemployment rate (UNR)—attained stationarity. These variables were significant at the 1% level, as indicated by their respective p-values of 0.006 and 0.004, leading to the rejection of the null hypothesis of non-stationarity for these two variables. The results of the first difference indicated that all the variables attained stationarity and were statistically significant at the 1% level, except for GDP, which was statistically significant at the 5% level.

Table 3: Summary of Phillip-Perron(PP) Unit Root Test Results

Variable	Phillip-Perron Statistic value	PP Test Critical value(5%)	Probability	Order of Integration	Remarks
PCI	-3.200847	-2.986225	0.0319*	I(1)	Stationary
EXPGDP	-8.431029	-2.986225	0.0000 *	I(1)	Stationary
FDI	-5.959530	-2.986225	0.0000*	I(1)	Stationary
GDP	-2.614529	-2.986225	0.1034**	I(1)	Stationary
UNR	-2.728707	-2.986225	0.0834**	I(1)	Stationary

* implies significant at 5% level and ** significant at 10% level

Source: Author's computations (2020) using Eviews7.

Table 3 presents the Phillip-Perron unit root test results. The results indicated that all variables, except EXPGDP, are non-stationary at levels because their calculated Phillip-Perron (PP) values are less than their critical values at the 5% level. To further complement the stationarity tests of the series used in the study, the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test statistic was also employed.

Table 4: Summary of Kwiatkowski-Phillips-Schmidt-Shin (KPSS) Unit Root Test Results

Variable	KPSS(LM) Statistic value	KPSS Test Critical value(1%)	Order of Integration	Remarks
Log(PCI)	0.185059	0.739000*	I(1)	Stationary
Log(EXPGDP)	0.190039	0.739000*	I(1)	Stationary
Log(FDI)	0.500000	0.739000*	I(1)	Stationary
Log(GDP)	0.175257	0.739000*	I(1)	Stationary
Log(UNR)	0.242257	0.739000*	I(1)	Stationary

Source: Author's computations (2020) using Eviews7.

The KPSS test statistic results indicated that the series is stationary after the first difference and is statistically significant at the 1% level. The KPSS (L-M) statistic values for all the series are less than the KPSS test critical values, leading to the acceptance of the null hypothesis of stationarity for the series. A notable difference between KPSS, on the one hand, and the ADF and PP test statistics, on the other, is that the null hypothesis of KPSS states "stationary," and the variables must be logged. In contrast, the ADF and PP null hypotheses are stated in the negative form as "non-stationary," and the variables do not need to be logged before the application of the test.

Table 5: Welfare equation estimate proxied by per capita income (PCI)

Dependent Variable: PCI
Method: Fully Modified Least Squares (FMOLS)
Date: 11/16/20 Time: 00:19
Sample (adjusted): 1992 2017
Included observations: 26 after adjustments
Cointegrating equation deterministic: C
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	75.20961	18.27667	4.115061	0.0005
EXPGDP	20.40409	5.929150	3.441318	0.0023
GDP	4.654515	0.290404	16.02771	0.0000
C	-322.0895	147.7193	-2.180416	0.0402
R-squared	0.956553	Mean dependent var		1410.923
Adjusted R-squared	0.950628	S.D. dependent var		973.3620
S.E. of regression	216.2787	Sum squared resid		1029082.
Durbin-Watson stat	1.744199	Long-run variance		26018.87

Source: Authors' computation using Eviews 7.

5. Discussion Of Results

From the estimated regression, it was observed that the coefficients of the explanatory variables—foreign direct investment (FDI), export contribution to gross domestic product (EXPGDP), and gross domestic product (GDP)—positively impacted welfare, as proxied by per capita income, reflecting the implications of a free trade area. Specifically, a unit change in FDI, on average, while holding other variables constant, results in an increase of 75.21 units or 7,520% in the welfare of individual households. Similarly, a unit change in export contributions to GDP leads to an increase of approximately 20.40 units or 2,040% in welfare as measured by per capita income.

Furthermore, it was observed that a unit change in GDP, on average, while holding other variables constant, results in an increase of about 4.65 units or 465% in household welfare. These findings imply that free trade activities contribute positively to the well-being of households.

According to the estimates, the positive effects of the variables—FDI, EXPGDP, and GDP—were statistically significant, with t-statistics of 4.12 (p-value = 0.001), 3.44 (p-value = 0.001), and 16.03 (p-value = 0.001) respectively, all at the 1% significance level. These findings contrast with those of Balogun and Dauda (2012), who found a negative relationship between trade liberalization and price incentives, which theoretically should stimulate domestic production. However, our findings align with those of Jensen and Solheim (2020) and Sabina & Eldin (2018), who conducted studies among selected African countries and found that regional integration and the reduction of intra-African trade barriers are second-best options for enhancing well-being in the region. Additionally, the results are consistent with the findings of Abrego, Amado, Gursoy, Nicholls, and Perez-Saiz (2019), who documented that international trade promotes welfare.

The combined effect of the explanatory variables on welfare, proxied by per capita income (PCI), as measured by the R-squared value of 0.956, indicates that approximately 96% of the total variation in welfare (PCI) was explained by the variables in the model. This leaves about 4% of the variation in PCI unexplained by the model, which can be attributed to extraneous factors outside the model. This high R-squared value indicates that the model is well-fitted. Additionally, the Durbin-Watson statistic of 1.7 suggests the absence of serial autocorrelation.

Table 6: poverty equation estimate proxied by the unemployment rate

Dependent Variable: UNR
Method: Fully Modified Least Squares (FMOLS)
Date: 11/16/20 Time: 00:29
Sample (adjusted): 1992 2017
Included observations: 26 after adjustments
Cointegrating equation deterministic: C @TREND
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	-0.213947	0.040364	-5.300496	0.0000
EXPGDP	-0.048861	0.012090	-4.041379	0.0005
C	4.804396	0.336055	14.29646	0.0000
@TREND	0.085740	0.014465	5.927529	0.0000
R-squared	0.729263	Mean dependent var		4.093462
Adjusted R-squared	0.692345	S.D. dependent var		0.697171
S.E. of regression	0.386698	Sum squared resid		3.289773
Durbin-Watson stat	1.712764	Long-run variance		0.126686

Source: Authors' computation using Eviews 7.

In the poverty model, proxied by unemployment, the estimated relationship between the unemployment rate (UNR) and the explanatory variables—EXPGDP and FDI—revealed a negative relationship with poverty, as represented by the unemployment rate. The study's coefficient estimates indicate that a unit change in FDI while holding other variables constant, leads to a reduction in the unemployment rate by -0.0488 or 4.9%. This finding was statistically significant at the 1% level, as demonstrated by the t-statistic of 4.04 and p-value of 0.001. Similarly, a unit change in EXPGDP, while holding other variables constant, results in a reduction of -0.2139 or 21.39% in the unemployment rate. This finding was also statistically significant at the 1% level, with a t-statistic of 5.30 and a p-value of 0.001. These employment-promoting variables align with the findings of Kim (2011), who asserted that international trade policy promotes employment.

To assess the explanatory power of the model, the coefficient of determination (R-squared) revealed a value of 0.729, indicating that approximately 73% of the variation in the unemployment rate was explained by the variables in the model, while about 27% was unexplained and attributed to extraneous variables outside the model. The adjusted R-squared value of 0.69 (69%) further supports the model's explanatory power, as it is well above the 50% threshold.

The Durbin-Watson statistic of 1.71 indicates the absence of serial correlation or autocorrelation among the variables. From these results, it can be deduced that export contributions and foreign direct investments (FDI) have the potential to reduce unemployment, thereby reducing poverty and promoting the well-being of the population. Therefore, it can be established that if export activities and FDI are fully harnessed through free trade activities among nations, unemployment can be further reduced to an acceptable level.

6. Conclusion

This study examined the effects of free trade zones on poverty, household welfare, and economic progress. Using time series data from 1991 to 2017, the researchers estimated welfare, proxied by income per capita, and poverty, proxied by unemployment models. To achieve the study's objectives, the coefficients of the key determinants—export contributions to gross domestic product (EXPGDP), foreign direct investment (FDI), and gross domestic product (GDP)—were estimated using a fully modified ordinary least squares (FMOLS) regression technique.

The study found positive relationships between foreign direct investment (FDI), export contributions to gross domestic product (EXPGDP), and gross domestic product (GDP), all of which were used to assess the implications of a free trade area on welfare, as captured by the per capita income of individual households. This implies that FDI enhances welfare in countries where free trade area policies attract investors from other nations to engage in business or investment activities. Furthermore, the study concluded that export contributions to GDP have a significant positive impact on household welfare. This suggests that an increase in export contributions leads to improved welfare outcomes for the population. Additionally, the results indicated that GDP growth promotes the welfare of individual households. The study also established that both FDI and export contributions to GDP contribute to a reduction in unemployment.

7. Recommendations And Future Research

Based on the findings of this study, it is recommended that policies aimed at further promoting household welfare and reducing poverty should be emphasized. These include the removal of restrictions on investor permits, the simplification of business registration requirements, and the implementation of other necessary measures that create a conducive environment for businesses to thrive. Additionally, promoting foreign direct investment (FDI) should be a priority, as it has been shown to have a positive impact on welfare. Policies that enhance exports, such as reducing tariffs, simplifying regulations, increasing the availability of credit to exporters, creating duty drawbacks, and improving cooperation among economic actors, should also be emphasized to fully capitalize on the benefits of free trade areas, including welfare improvement and poverty reduction. Moreover, to foster economic growth and further enhance household welfare while mitigating poverty, there should be a strong focus on policies that accelerate the country's output, including structural changes and infrastructural development.

However, due to its novel nature, this study faced certain challenges in achieving its objectives. These challenges included obtaining the necessary data and variables to accurately capture free trade zones and their effects on household well-being, as well as anticipating future effects of free trade zones. Nevertheless, the study successfully navigated these challenges by employing appropriate variables and data as proxies to achieve its goals. Based on this experience, the study suggests that further research be conducted in this field, particularly focusing on forecasting and predictive studies concerning the effects of free trade zones.

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