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IMPACT OF ECONOMIC INTEGRATION ON FOOD SECURITY IN NIGERIA (2014-2023)

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Abstract: *This paper investigated the impact of economic integration on food security in Nigeria from 2014 to 2023. Descriptive analysis and multiple regression model have been applied. Non-probability sampling was used in selecting six varieties of food crops produced in Nigeria namely, Maize, Guinea corn, Millet, Cassava, Yam and Palm oil. Descriptive analysis, and multiple regression were applied in analyzing the data collected on the selected food crops. The paper found insignificant increase in the production of Maize, Guinea corn, Millet, Yam and Palm oil, while the production of cassava has dropped significantly, the paper also observed alarming and significant increase in prices of all the selected food items within the period under investigation. It further revealed positive relationship between food security and economic integration. The paper concludes that Nigeria's commitment to economic integration is not a threat to food security in the country and linked food crisis in Nigeria to macroeconomic instability and other indigenous socioeconomic causative factors. To achieve food security, the paper recommends huge public and private sector investment in mechanized farming, plantation agriculture, and establishment of agro-allied, processing and manufacturing industries in Nigeria.*

Keywords: *Economic Integration, Food Security, Multiple Regression, Nigeria*

Introduction

The role of food supply, food sufficiency and food security on the continuous survival of living creatures on earth is undebatable, hence food security remains a key priority to all nations of the world generations after generations. With food abundance, nations can focused on vital issues like territorial security, innovation and governance among others. Historically, no nation suffering from severe food crisis prosper economically, politically and socially. This background provided a basis for nations to adopt workable strategies that will facilitate efficiency in food production, with a view to ensuring food surplus for domestic consumption and for exportation. Provision of raw materials for industries also triggers investment in Agriculture to cultivate food and other related stuffs. Food sufficiency spur inflow of people from neighboring countries and far while countries with severe food shortage experience massive drain of human resources. It is pertinent to assert that food security is among the superior objective of economic growth and development of countries.

However, countries have been in contact with one another for collective mutual economic benefits, food exchange and other paramount bilateral issues. Several times, agreements and treaties for exchange of food, manufactured goods and professional services were signed by the Heads of Countries. The integration of nations create multiple opportunities and economic gains for many nations. The economic integration was common among peer countries, virtually with common challenges. In Africa for example, there is a popular unified platforms that integrated the 54 countries, called African Union (AU), whereby sensitive socioeconomic and political issues bothering African continent are usually peer reviewed by the representatives of African Countries. Deliberations and resolutions are unanimously reached for the common good of Africa.

On the other hand, each African sub-region of Africa established a sub- integral platform for mutual economic benefits of the region. In West Africa for instance, the integral platform is called Economic Community of West African States (ECOWAS), with sixteen West African Countries as members. Other similar unions exist in the East Africa, in the Central Africa and the South African sub-region.

However, economic integration gives opportunity for movement of goods and services, as well as designing a unified approach to deal with economic, political, social and security issues affecting regions and countries. In ECOWAS for instance, goods, services and people are more often moved freely among the 16 countries without restrictions. The goods commonly exchanged include Agricultural produce, and varieties Animals in large quantities.

Developing countries still face many food security risks, and Africa's proportion of hungry people is 21%, the highest in the world (FAO, 2021). According to Food and Agricultural Organization (FAO), the global reduction of hunger stopped in 2014, and the Covid-19 pandemic has worsened the situation. In 2020, 768 million people were undernourished, and one third of them, 282 million, were Africans. FAO projects a significant deterioration in African food security by 2030 while the global situation simultaneously improves slightly. Therefore, enhancing food security in Africa is likely to remain high on the development policy agenda for the coming decades.

Nigeria being the most populous and geographically advantaged exports large quantities of food items such as grains, onions, tuber crops and fish, in addition to cement and a number of manufactured items to virtually all West African countries and beyond. Equally, a number of items such as fruits and Animals from the republic of Niger are plentifully imported to Nigeria. Countries at the coastal areas facilitate importation of fairly used vehicles, parboiled rice and cooking oil to Nigeria.

Nonetheless, not much researches on the impact of economic integration on food security have been conducted. The fewer ones conducted were conducted largely in Europe, Asian and some parts of Africa. For example Mevel and Karingi, (2012) conducted a research on a specific aspect of economic integration in Africa, but the research did not cover the West African sub-region. Secondly, none of the researches used a sample from 2024 to 2023, as such the sample used for this research is unique. The methodology used in the topic is also used for the first time. These reasons justified the huge gap and the significance of this study. Considering the very large population in Nigeria estimated to about 216, 000,000 people in Nigeria, the country need to critically investigate the cost and the benefits from the economic integration to the country, particularly its impacts on the food security. To achieve this objective, this paper investigated the impact of

economic integration on food security in Nigeria. Specifically the paper investigated the impact of economic integration on food supply, food prices and access to food in Nigeria using descriptive statistics and multiple regression analysis.

Economic Integration

Economic integration encompasses the formulation and application of common regional trade, exchange and labour markets. Common fiscal and monetary policies at the regional level. Economic integration also allows movement of all factors of production and technology within the region (Rwegasira, 1996). Generally, economic integration is defined as a state or process that derives its importance from the potential for its participants to achieve a variety of common goals more effectively by joint or integrated action as opposed to unilateral effort. Some economists define it as “a state of affairs or a process involving the combination of separate economies into a larger economic region” (Asante, 1997). This could include all measures that aim at abolishing discrimination among the member countries of the unit, with the formation and application of coordinated and common economic policies to achieve various economic and welfare objectives. In some studies the concept of economic integration is used interchangeably with economic regionalism or economic union. Economic Integration could also be defined as “the design and implementation of a set of preferential policies within a regional grouping of countries aimed at the encouragement of the exchange of goods and factors between members of the group” (Mills & Handley, 1998).

Different levels of economic integration exist, namely a preferential trade area, a free trade area, a customs union, a common market, an economic union and a political union Balassa, (1961).

Food Security

According to the World Food Summit Plan of Action 1996, a widely accepted definition, food security exists when “all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.” This definition involves several conditions which, when all are met, constitute a situation of food security. Generally, three elements of food security are distinguished: Food availability, food access and food utilization. Food availability refers to sufficient quantity of food for everybody through household production or purchase (local or imported products). Food access depends on ample purchasing power and resources as well as functioning markets to obtain adequate food. Household income, its distribution within the household at an individual level and food prices are relevant factors to be considered. Food utility relates to dietary habits. It entails proper biological use of food, requiring potable water and adequate sanitation.

Theory of Regionalism vs. Multilateralism

This theory explores the choice between regional economic integration, such as free trade agreements between a group of countries and global multilateralism, such as the World Trade Organization. It examines the trade-offs between deeper integration within a region and broader integration across the global economy, considering factors such as economies of scale, political considerations, and potential trade diversion effects. The theory of Regionalism vs. Multilateralism is not attributed to any single individual or a specific economist. Instead, it represents a broader framework used by scholars and policymakers to analyze and understand the trade-offs and choices involved in economic

integration at regional and global levels. The concept of regionalism vs. multilateralism is frequently explored in the context of international trade and economic cooperation, where countries have the option to form regional trade blocs (like ECOWAS, NAFTA, or the European Union) or engage in multilateral agreements facilitated by institutions such as the World Trade Organization (WTO).

Literature Review

Several studies have assessed various aspects of African economic integration. As the analyses are ex ante, they typically employ CGE models that use economic theory and data on economic structures to compare hypothetical policy changes. The global CGE models are the only tool that can consistently model countries' domestic production and consumption possibilities with international trade flows in sufficient detail. These models have been widely used in the contexts of multi- lateral and regional trade agreements since their creation in the early 1990s (Hertel, 2013). The earliest work on the continent-wide FTA in Africa is by Mevel and Karingi (2012), from the same year as the AUC's decision to form the FTA. The study considered abolition of all the tariffs within the FTA. The results established some commonalities that reappeared in subsequent studies: 1) the GDP will increase moderately, and 2) intra-African trade would get a significant boost. A follow-up study by Mevel and Karingi, (2013) focused on a sector that is especially important in Africa, agriculture. The study found that in addition to the positive results, some countries might see agricultural sectors contracting.

Methodology

Questionnaires and interviews methods were used to collect data primarily from households, farmers and Agricultural marketers in the six geopolitical zones of Nigeria. The study applied descriptive analysis in the form of mean, medium, Standard Deviation, Minimum and Maximum, as well as regression analysis. Pre analysis diagnostic tests were conducted before running the regression analysis, such as the tests for normality, linearity, multicollinearity and homogeneity. All these assumptions are conducted using SPSS software version 25. Finally, the best prediction of dependent variable and independent variables was measured through the regression result.

Data Analysis

Table 1. Comparative Analysis of Changes in Average Food Production and Average Food Prices in Nigeria (2014-2023)

Food Item	Average Production (2014-2018)	Average Production (2019-2023)	D/f	% Inc./Dec	Average Price in Naira (2014-2018)	Average Price in Naira (2019-2023)	D/f	% Increase
Maize	11mmt/an	12.5mmt/an	1.50	13.64	110/kg	480/kg	370	336.36
Guinea Corn	6.8mmt/an	7mmt/an	0.20	2.94	115/kg	460/kg	345	300.00
Millet	1.8mmt/an	2mmt/an	0.20	11.11	120/kg	480/kg	360	300.00
Rice	3.7mmt/an	5.4mmt/an	1.70	45.95	370/kg	920/kg	550	148.65
Cassava	59.5mmt/ha	34mmt/an	25.5	42.86	85/kg	160/kg	75.0	88.24
Yam	42mt/an	44.1mmt/an	1.90	4.52	225/kg	550/kg	325	144.44
Palm Oil	1.2mmt/an	1.4mmt/an	0.20	16.67	550/liter	1000/liter	450	81.81
Obs	07	07	07	07	07	07	07	07

Source: *Author's Computation*

Table 1 presents a comparative analysis of changes in average food production and average food prices in Nigeria from 2014 to 2023. The table considered food production and food prices from 2014 to 2018 and compared it with food production and prices from 2019 to 2023. Essential food items such as maize, Guinea corn, Millet, Cassava, Yam and Palm oil are selected from varieties of food items produced in the country. The results show that the average maize production increase from 11 million metric tons per annum for 2014-2018 to 12.5 million metric tons per annum for 2019-2023. This indicates a slight increase of 1.5 million metric tons (0.2%) after five years, while the corresponding prices of maize per Kilogram increases from 110 Naira to 480 Naira for the same period, with a price difference of 370 Naira, equivalent to 336.36% increase in the price of maize in five years. By implication, the maize prices had significantly outweighs maize production within the same period.

On the other hand, production of Guinea corn increased averagely from 6.8 million metric tons per annum for 2014-2018 to average of 7 million metric tons, indicating 0.20 unit difference, equivalent to 2.94% average increase after five years. Within the same period, the average annual price per kilogram of Guinea corn surged from 115 Naira to 460 Naira, given difference of 370 naira, equivalent to 300% increase in five years.

Millet annual average production rose from 1.8 million metric tons for 2014-2018 to 2 million metric tons for 2019-2023, with a slight difference of 0.20 metric tons, equivalent to 11.11% average increase in five years. The corresponding annual average price per kilogram rose from 120 Naira for 2014-2018 to 480 Naira for 2019-2023, with a price

margin of 360 Naira per kilogram, indicating 300% increase in the average price in five years.

Furthermore, annual average rice production rose from 3.7 metric tons to 5.4 metric tons, indicating 1.7 million metric tons difference, equivalent to 45.95% production increase in five years. The corresponding annual average price per kilogram of rise rose from 370 Naira for 2014-2018 to 920 Naira per kilogram for 2019-2023, indicating a price margin of 550 Naira in five years, equivalent to 148.65% price increase.

The average Cassava production was 59.5 metric tons for 2014-2018, which dropped to 34 metric tons for 2019-2023 indicating a sharp decrease in the production by 25.5 metric tons, equivalent to 42.86% decrease in five years. The corresponding average price per kilogram of cassava rose from 85 Naira for 2014-2018 to 160 Naira for 2019-2023, with a difference of 75 Naira, equivalent to 88.24% in five years.

Within 2014-2018, an average of 42 million metric tons of Yam was produced in Nigeria, which rose to average of 44.1 million metric tons from 2019-2023, with an increased margin of 1.9 million metric tons, amounting to 4.42% increase in five years. Correspondingly, a tuber of Yam of 1 kilogram weigh was sold at an average price of 225 Naira from 2014-2018, which surged to 550 Naira after five years, given a margin difference of 325 Naira, equivalent to 144.44%.

Nigeria produced an average of 1.2 million metric tons of palm oil from 2014-2018, which rose to an average of1.4 million metric tons from 2019-2023, with a margin difference of 0.2 million metric tons, equivalent to 16.67%, at the same time, a liter of palm oil was sold averagely at 550 Naira from 2024-2018, but the average price increased to 1,000 per liter from 2019-2023, indicating a positive change in the price by 450 Naira in five years, reflecting 81.81% increase in the average price.

Table 2: Descriptive Analysis Metric Tons (in Millions) of Essential Food Produced in Nigeria from 2014 to 2023

Food Item	Minimum	Maximum	Mean	Std. Deviation
Maize	11.0000	12.500	16.250	5.2500
Guinea Corn	6.8000	7.0000	6.9000	0.1000
Millet	1.8000	2.0000	1.9000	0,1000
Rice	3.7000	5.4000	4.5500	0.8500
Cassava	59.000	34.000	46.500	13.000
Yam	42.000	44.100	43.050	1.0500
Yam	42.000	44.100	43.050	1.0500
N	07.00	07.00	07.00	07.00

Source: Author's Computation

As shown in the Table 2, the descriptive analysis states that variables have 07.00 observations. Maize has the mean value of 16.250 while the maximum value is 12.500 and 11.0000is the minimum value. Guinea Corn has mean value of 6.900, minimum value of 6.800, maximum value of 7.000 and the standard deviation of 0.100. Millet has mean value of 1.900, minimum value of 1.800, maximum value of 2.000 and the standard deviation of 0.1000. The standard deviation for rice is 0.8500, a mean value of 4.550, minimum value of 3.700 and the maximum value of 5.400. Yam has the minimum value

of 42.000, maximum value of 44.100, mean value of 43.00 and the standard deviation of 1.0500. Moreover, Palm oil has the minimum value of 42,000, maximum value of 44.100, mean value of 43,050 and the standard deviation of 1.0500.

Table 3: Regression Analysis

Model	Standardized Coefficients	t	Sig.
	Beta		
(Constant)		2.932	.004
Economic Integration	-1.107	-4.645	
Domestic Food Supply	-.386	-3.616	.001
Market Price	-.636	-2.771	.007
Food Share to GDP	-.291	-.755	.453
GDP Per Capita	-.101	-1.067	.290
Adjusted R Square	.334		
F	10.890		
Sig	.000		

Source: Author's Computation

The table also shows coefficient analysis for economic integration, food production, domestic food supply, market prices and share to GDP towards the dependent variable which economic integration. The results on the regression test show that economic integration growth has positive relationship with food security, food production, domestic food supply, market price and the GDP. Based on the significance level 1%, the alternate hypothesis that stated economic integration has significance relationship is accepted. The plausible reason for the positive relationship in Nigeria may be connected with the rich vegetation in the country, whereby all categories of food items captured in the paper are grown at different periods depending on the region. For example the northern part of Nigeria grow maize at different time it is grown in the south, as such the supply of food in Nigeria is continuous. Despite the increase in supply of food in Nigeria, the prices continue to increase significantly. This is not unconnected with other factors not captured in this study, such as exchange rate, export of food from Nigeria to other West African countries, population growth, and supply of money among others.

Conclusion

This paper investigated the impact of economic integration on food security in Nigeria from 2014 to 2023. Descriptive analysis and multiple regression analysis have been applied. Three cereal crops, two tuber crops and one plantation crop was examined, namely, Maize, Guinea corn, Millet, Cassava, Yam and Palm. Food supply was used as a dependent variable while domestic food supply, food production, market price, share of food output to GDP and GDP have been used as independent variables. The paper concludes that there was insignificant increase in the production of Maize, Guinea corn, Millet, Yam and Palm oil, while the production of cassava has dropped significantly in Nigeria from 2014 to 2023, the paper also concludes that there is a very disturbing and significant increase in prices of all the selected food items within the period under investigation. The paper further concludes that there is positive relationship between food

security, economic integration, food production, domestic food supply, market price and the Gross Domestic Product (GDP). Moreover, the paper concludes that Nigeria's commitment to economic integration is not a threat to food security in the country. This is possible because, Nigeria is Africa's most populous country and the population of other 15 West African countries, Cameroon and Chad that trade food with Nigeria is insignificant to cause harm to food security in Nigeria. Therefore, food crisis in Nigeria might be as a result of instability of other macroeconomic variables such as price, unemployment and exchange rate volatility.

Recommendations

1. The paper recommends establishment of special intervention/grant to food farmers especially farmers of Maize, Guinea corn, Millet, Yam and Palm oil and cassava being the major food items consumed in Nigeria. Federal Ministry of Agriculture should ensure strict implementation, monitoring and success of the programme in order to achieve food sufficiency and security in the country.
2. The paper recommends establishment of task force that will fight food hoarding and speculation in Nigeria. This will help immensely in stabilizing the food prices and ensure adequate supply of food items in the markets
3. Since positive relationship is observed between food security, economic integration, food production, domestic food supply, market price and the Gross Domestic Product (GDP), Nigeria should uphold its commitment to economic integration, considering other numerous benefit drawn from the integration.
4. The paper linked food insecurity in Nigeria to other indigenous factors and macroeconomic instability in the country. The paper therefore recommends formulation and implementation of effective macroeconomic policies that will help in price stabilization, increase in production and supply of food, job creation and achieving sustainable food security.

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