



A STATISTICAL ANALYSIS OF THE IMPACT OF ECONOMIC RECESSION ON FOOD PRODUCTION IN NIGERIA

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Abstract

In this work, we analyze the impact of Economic Recession on food production in Nigeria using Ogwashi-Uku, Delta State, Nigeria as a case study. The data was obtained through face to face interview and from structured questionnaire. The analytical tool used for the analysis is chi-square. The multiple bar chart shows that there is an increase in food production within the year 2014 – 2016. Results gotten from the data analysis using chi-square also shows that Economic Recession has caused an increase in food production in Ogwashi-Uku, Delta State within the period of Economic Recession. Thus, we conclude that Economic Recession has increased Agricultural Production generally in Nigeria.

Introduction

This research work “Statistical Analysis on the Impact of Economic Recession on good Production in Nigeria entails the effect of recession on the production of foods on the Nigerian Economy. It helps to show how recession affects an economy in the area of food production. It is to show weather economic recession affect food production negatively or positively. It is also to determine if the number of persons that goes into food production are increasing or reducing as a result of the recent economic recession.

In some countries, economic recession has been part of their experience and challenges which has affected them in various areas as well as production of food. Generally, a country experiencing recession is said to be experiencing a decline in economic activities which might affect citizens negatively due to slowdown in the economy.

Economy recession is known to last for months. It includes drop in the following economic indicators: Real GDP, income, Employment, manufacturing and sales. When there’s an economic recession, food production in the country changes in so many ways which might be a disadvantage or an advantage. The production of food can be seen in so many ways including farming and the processing of raw materials into consumable goods.

Production process and cost changes as the economy changes and during economic recession where there is unemployment, increased cost in goods and services, low income which is not always enough for human expenditure, many citizens who cannot afford the purchase of food (Due to increment in the price), venture in food production (farming etc.) in order to fit and survive during the period of the economic recession.

2. Review of Related Literature

The National Bureau of Economic Research (NBER) defined recession as a significant decline in Economic activity spread across the economy lasting more than a few months, normally viable in a real Gross Domestic Product (GDP) real income employment industrial production and wholesale and retail sales.

The International Monetary Fund (IMF) as well as the Central Bank of Nigeria have all agreed that Nigeria Economy has plunged into recession. They asserts that Nigeria’s economy may not again stability until early 2018 with low growth rate of 1.5%. Economic recession is said to be worse than depression.

Food production which is directly related to Agriculture should be considered as it has a relationship to economic recession and development. Global economic recession and the concomitant increase in food prices, unemployment, dilapidated infrastructure and poor industrial growth call for a concerted effort at ensuring a strong and efficient agriculture to meet the demands of ever increasing Nigeria population, no meaningful development can be attained without recourse to modern agriculture since virtually all facets of human endeavour relies primarily on products or bye-products of agriculture.

Nigeria was strongly an agrarian nation considering her economy during the pre and post colonial era and agriculture formed the means of livelihood of the people and a strong factor of the rise of states just as the case everywhere in the world (Lawal, 1997). The farm of agriculture practiced

and the crops planted were determined by the nature of soil and the Terrain of the region. Shifting cultivation and crop rotation characterized agricultural practices in pre-colonial Nigeria, Owing primary to land tenure practice and lack of knowledge of highly mechanized farming (Ehimore, 2009).

Nigeria, according to its seven point agenda is focusing on developing agriculture as an important strategic move to the progress of the country. Nigeria is fortunate to have an abundance of fertile soil along with a climate suitable for agriculture. There is also a supply of human resources that could benefit from having the agricultural sector to work in. As stated above, Nigeria can join the league of economically developed nations by focusing on the improvement of its agricultural sector.

A recent group of study (Diao, Xinshen, Hazell, Pete and Thurlow, 2009) examined the effect of other channels of growth on the decrease in poverty and overall growth rate in six low-income countries of Africa. The findings of that research can be applicable to Nigeria as well. According to the study, industrial growth is less effective in reducing poverty than agricultural growth because a major percentage of the population (about 70%) live in rural areas.

The agricultural sector is favourable as it allows greater employment opportunities for the poor. It was also noted by (Diao et al) that even though the industrial sector is important, countries may not be able to launch a successful economic transformation without agriculture.

Nigerian economy during the years 1981 to 2003 identified the various factors that have an impact on the national agricultural production in Nigeria. They specifically examined include population growth rate, GDP growth rate, consumer price index, food import values and the expenditure of government on the agricultural sector in their study (Muhammed et al) found that a negative co-efficient exists between the values of food imports. This means that whenever food import in the country increases, national agricultural production tends to decline.

2.1 Nigeria's Economic Recession into Agriculture Relation

The Nigeria Bureau of Statistics (NBS) states that Nigeria is at its worst economic recession experienced in the past 29 years, (Chijioke and Femi, 2016) states that Agriculture and ancillary Agro-business are the magic wands that can save Nigeria.

To cushion the effects of recession and boost household income many Nigerians, according to second quarter figures from the national bureau of statistics are exploring opportunities in primary agriculture and agro-food sector for increased employment and export earnings.

For sustainability and food security, experts believe government needs to consider farming as serious business rather than an alternative to crude oil, if food security will be achieved. The point is, Agriculture and the many offshoots are catalyst for job creation and opportunity to provide food rather than the serial important of what Nigerians can produce and the associated waste of hard earned foreign exchange.

It is on record that Nigeria has over 84 million hectares of arable land, out of only 40% is cultivated. Estimated at over 180 million people, it is also emerging as Africa's largest agricultural market. Supported by nature, the country's crops that could earn huge foreign

exchange include beans, yams, cassava, cashew nuts, cocoa beans, groundnuts, gum Arabic, kolanut, maize, banana, melon, millet, palm kernels, rice, rubber soybeans etc. These have potentials of commercial quantities. Agriculture contributes much to Gross Domestic Product (GDP) growth and employment creation in Nigeria and should be recognized as a key driver of economic growth. Improvements in agricultural production are necessary for Nigeria to attain self-sufficiency in food and indeed meet the larger picture of the right to food of its citizen and residents to Nigeria. This is especially important now that the country is experiencing recession. The right to food is a right recognized by the International Covenant on Economic Social and Cultural Rights (ICESCR) ratified by Nigeria. This ratification places Nigeria under the obligation to take steps and at maximum to ensure available resources for the progressive realization of the right to food of Nigerians.

Managing Director, Poultry International Company Limited (Mrs Yemisi Iranloye) advocated increased support for farmers and inventory in the out-grower scheme adding that government needs to incentivize activities in the agri-sector for its contributions to the economy to be meaningful. She noted that small-holder farmers are often ignored, yet the nation depends on them for food. (Emmanuel, 2011) states that one of the solution to economic recession in Nigeria is “increase in Agricultural produce and export.

The traditional approaches to the role of agriculture in economic development is formulated in terms of the contribution the agricultural sector can make or the functions it can perform during the process of economic development. (Anyanwu et al 1997) as stated by Reynolds (1975), agriculture development can promote the economic development and releasing the labour forces needed for industrial employment, enlarging the size of the domestic market.

Agriculture has been assigned an important role in Nigeria’s development (solution to economic recession). It has been seen as a means of reducing dependency on importations, increasing farm incomes at time of severe unemployment and rural poverty. In order to determine the relationship between agriculture and economic development, regression analysis was carried out to establish the relationship between the factors that contribute to economic development and their level of contribution to economic development the correlation test show that employment generation had positive correlation at 5% level of significance. This indicates that agriculture through employment generation tends to contribute to Nigeria’s economic development. This could also be due to the fact that most Nigerian Youths are employed through agricultural production activities.

The contribution of agriculture to poverty reduction correlation positively at 10% level of significance this indicates that poverty can be reduced through agricultural production and this contributes to economic development in Nigeria.

The National Bureau of Statistics recorded the food price inflation due to economic recession from the year 2015. In the first half of 2015, food prices opened at 9.2% in January and increased at a faster face to reach 10.0% by June, 2015. Food prices opened the year by increasing at the same pace in January as recorded in December at 9.2% most groups that contributes to the food sub-index increased at a faster pace in the months of January and February but food prices showed in March increasing at relatively the same pace in March as in February by 9.4%. The pace of increase was weighted upon by a slower increase in the Bread and cereals, oil and fats, Diary and confectionary groups. Beyond March, food prices edged higher as farm product inventories were drawn down and the late on set of rains which have pushed back the harvest

season. This was coupled with higher transportation costs due to limited PMS (Premium Motor Spirit) availability which impacted increase in the movement of goods produced. The above can only be tackled with more involvement in agricultural production.

The present economic recession in Nigeria is a manifestation of long term ills in the structure of the economy that became full-blown under the present government. The recession seems to affect socio-political structures, Nigeria's credit condition, general living standard as well as consumption demand in Nigeria in 2016. Eneji Mathias Dinis Malilafice and Dr. Mrs. Rose Ijeoma Umejiaku 2011 wrote on the impact of Nigeria's recession on Agriculture; What Nigeria should realize is that by allowing the import of goods that can be produced in Nigeria, we export wealth and jobs to those countries and import recession, unemployment and poverty to Nigeria. The country has had no control over the price and output of oil at the domestic and International market. They further said that addressing the economic recession requires a shift from a mono-product economy structure, over dependence on imports and diversification of the economy with at least 70% local contents. Nigeria must change the structure of the economy and move away from oil to agriculture the youth with all their energies and education should not shy away from agriculture but embrace it with pride and dignity of labour as a business and means of livelihood.

Government should encourage and promote modern agriculture for big and small farm holders. There should be deliberate policy to demystify the oil sector and promote the manufacturing sector and small and medium scale enterprises.

2.3 Averting Economic Recession in Nigeria via Agriculture

Nigeria's economy has been forecast to be amongst the top 20 largest in the world by 2030, according to a recent report of "Bloomberg (one of the world's leading financial services firms) on the new world economic order. A Lokoja based economic analyst said that although the Nigerian Economy could not be said to have gone into recession if Agriculture was encouraged. (Muhammed, 2016).

However, Dr. Arosanyin, the National Technical Adviser, All Farmers Association (AFAN) underscored the need for increased investments in the agricultural sector, saying that Nigeria was facing several Economic challenges which included growth decline, decline in oil prices and over dependence on imports. He said that the other challenges were poor infrastructural facilities such as electricity, roads and water which inhibited Secondary Production and Industrial growth as well as corruption and insecurity. He stressed the wisdom in addressing the challenges pragmatically, insisting that at the moment, Nigeria ought not to be imparting products like textiles, biscuit, fruit juice, rice and sugar. Arosanyin in 2015 added that considering the vast agricultural potential of the country, it should be able to produce these products amongst others locally.

The way forward is for the present administration in the country to tackle the problems head-on by focusing its attention on the structured development of agriculture, solid minerals and tourism sectors. He however, emphasized that the government's agricultural policy include immediate, medium-term and long-term actions and programmes. He said that if agriculture sector was well-funded and properly developed, the government's effort to avert any economic recession would be fruitful.

Arosanyin argued that agriculture, apart from solving hunger and food security problems, was also capable of generating over millions of job opportunities, thus reducing the menace of unemployment sharing similar sentiments, Mr. Devakumar, the Group Executive Director of Dangote group of companies in 2016, said that tangible efforts should be made to reduce the effects of the collapse of crude oil prices in the international market on the nation's economy. He (Devakumar) stressed the salvation of the Nigerian economy would largely depend on increased agricultural production and local manufacturing. Edwin (2014) underscored the need to fully exploit the vast agricultural potential of Nigeria in efforts to restructure the national economy. He called on entrepreneurs to invest in agricultural and manufacturing projects to speed up the country's economic growth. All in all, analysts believe that increased investments in Nigeria's agricultural sector will spur the country's development, while ensuring its economic revival and guarding against any Economic recession. (NAN).

President Buhari, in his address at the conference of the Nigerian Association of Chambers of Commerce, Industry, Mines and Agriculture (NACCIMA) called for more private investments in the agricultural sector of the Economy. He said that increased investments in the agricultural sector remained the best way to unlock the country's economic potential and curb its excessive dependence on oil revenues.

“Growing our own food, processing what we produce, becoming competitive in export markets and creating jobs all across the economy are crucial for our national security” he said Agriculture is the main stay of the economy of any nation and we have to look inward to make the sector a high priority by developing and exploiting the resources of the sector (without paying lip service) for the welfare of the citizens. It is noted that agricultural sector made Brazilian economy to outweigh that of all other South American countries and is expanding its presence in the world market (Brown, 2000). Nigeria today, in view of our high population growth and high level of unemployment the agricultural sector can be raised to the status of labour absorptive and intensive capacity to meet the challenges of the accelerated growth in our population. The model could serve as alternative strategy of exploiting the natural resources in the sector using labour intensive technology which has a favourable disposition and adaptation to the immediate environment of the peasant farmers that constitute the major producers of staple foods crops in the country today.

They also analysed the trend of Nigerian Agricultural policies and a glimpse at agricultural development and they wrote thus: Nigerian economy can be classified into three (3) major sectors: (i) Primary Sector: agricultural and natural resources, (ii) Secondary Sector: Processing and Manufacturing (iii) Tertiary Sector: Services the agricultural and industrial sectors exhibit a structural dualism where the former operated subsistence production with modern farming while the later comprises of modern enterprises which coexists with large numbers of micro enterprises especially in the informal sector. Nigerian agriculture is the main stay of the economy and the major food supplier and earner of foreign reserves in 1960's and 1970's. It has the traditional role of providing food for the population, raw materials for industries and substantial surplus for exports. Nigeria was a leading exporter of other major commodities such as cotton, groundnut, rubber and hides and skins (Alkali, 1997).

Agricultural Sector contributed over 60% to the GDP in 1960's despite the reliance of Nigerian Peasant Farmers on traditional tools and indigenous farming method and these farmers also produced over 70% of Nigeria's exports and 95% of its food needs (Lawal 1997). The root of the crisis in Nigerian agriculture also lies in the total neglect of the sector by successive

government through payment of lip service to the sector. The increased dependence on a mono cultural economy based on oil production (Ogen, 2007) is another factor. A case of Dutch disease. Nigeria became a new importer of various agricultural products ranging from palm oil, cotton, wheat, rice, maize to other agricultural products. For instance, Nigeria has been spending an average of 60 million USD on importation of rice annually and indeed in q994, agricultural sector performed below the projected 7.2% of the budgetary output (Lawal, 1997).

3.0 Methodology

The data collected were primary data within the axis of Ogwashi-uku. This research work's data was generated using questionnaire and face to face interview based on observation on signs of agricultural activities within the neighbourhood and on farmlands. The interview and questionnaire conducted involved respondents who gave the indication that they were one way or the other involved in agriculture. The following food items were considered.

(i) Cassava (ii) Yam (iii) Vegetables (iv) Mixed (i.e more than one food item).

This idea was based on the popular demand of these items and topography of Ogwashi-uku.

Afterwards Yammiss equation

$$n = \frac{N}{1 + Ne^2}$$

was used in determining the sample size to be used for further research.

n ⇒ Sample size
N ⇒ Target population
e ⇒ Error bound

The instrument of questionnaire was then used to interview the selected samples. One of the 500 questionnaires distributed by hand (Door to Door). There was 95% success (Response) resulting in:

$$\frac{95}{100} \times 500 = 465$$

Successful filled questionnaires

3.1 Chi-Square Test for Independence

The chi-square test for independence can be used for a good fit test or test of independence. For this research work, the test for independence is sort.

4.0 Data Presentation

TABLE I : Farmer and Farm Produce for Various Years

Product/Year	2014	2015	2016	TOTAL
Cassava	19	31	89	139
Yam	23	34	76	133
Vegetables	34	46	57	137
Mixed	10	16	30	56
Totals	85	127	252	465

TABLE I: Shows the number of sampled farmers who went into production of cassava, yam, vegetable and mixed farming from 2014 – 2016.

4.1 MULTIPLE BAR CHART

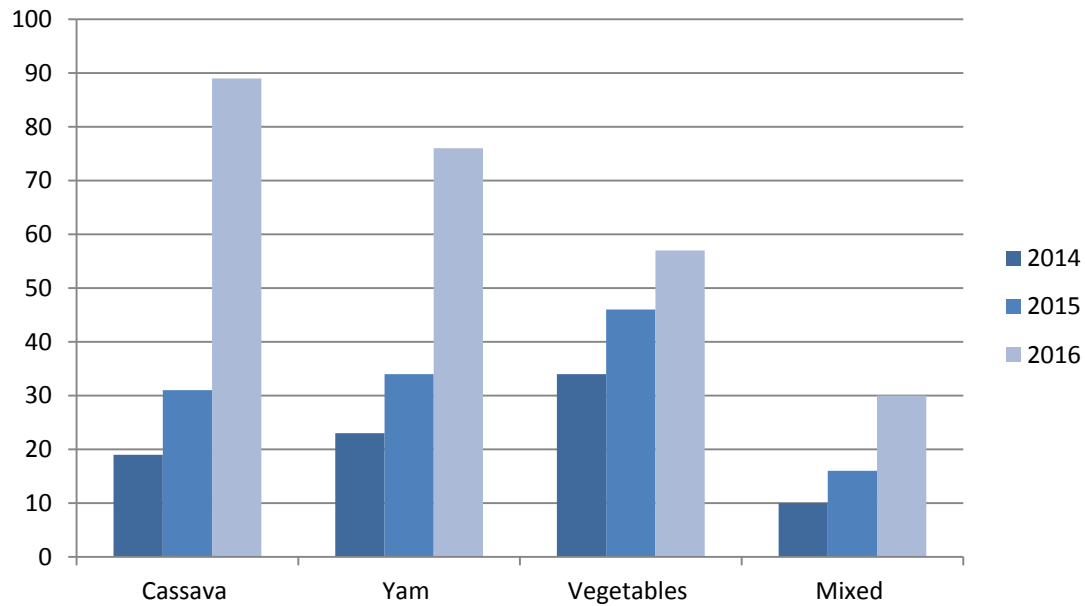


Fig. I: Multiple Bar Chart Showing Food Production from 2014 to 2016

The bar chart shows a significant increase in food production from 2014 to 2016 in all the various foods but that cassava in 2016 is almost times that of 2015.

Yearly Totals for Food Production

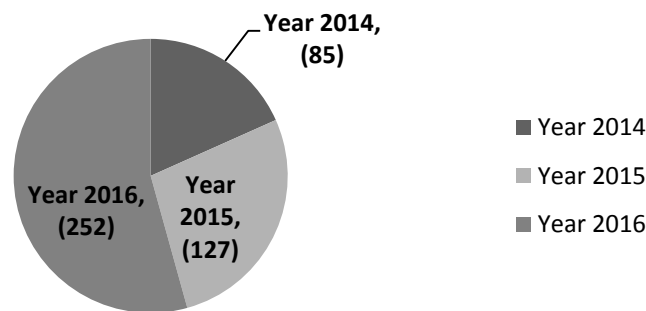


Fig. II: Pie Showing Total Food Production from 2014 to 2016

It is evident from the pie chat that total number of persons that goes into food production (farming) in 2016 is more than those that goes into farming in 2014 and 2015 put together.

4.2 PERCENTAGE OF SAMPLED FARMERS

Using the data in Table I, Percentage of sampled farmers involved in the production of a specific food item:

$$\text{Cassava} = \frac{139}{465} \times 100 = 29.89\%$$

$$\text{Yam} = \frac{133}{465} \times 100 = 28.60\%$$

$$\text{Vegetables} = \frac{137}{465} \times 100 = 29.46\%$$

$$\text{Mixed} = \frac{56}{465} \times 100 = 12.05\%$$

4.3 Test of Hypothesis

Using the data in Table I,

H₀: Economic recession will not increase food production.

H₁: Economic recession will increase food production.

$$\alpha = 0.05$$

$$\chi^2_{\alpha}(r-1)(c-1) \Rightarrow \chi^2_{0.05}(4-1)(3-1)$$

$$\chi^2_{0.05}(3)(2) = \chi^2_{0.05}(6) = 12.592$$

Decision Rule:

Reject H₀ if $\chi^2_{cal} > \chi^2_{\alpha}$

TEST STATISTICS

The table values will be tested against the test statistics which is given by the formula;

$$\chi^2_{cal} = \sum \frac{(O_i - e_i)^2}{e_i}$$

The value in table Table I of O_i.s values.

Table I: Observed values (O_i 's)

Product/Year	2014	2015	2016	Total
Cassava	19	31	89	139
Yam	23	34	76	133
Vegetables	34	46	57	137
Mixed	10	16	30	56
Total	86	127	252	465

Table II: TABLE OF Expected Values (e_i 's)

	14	15	16	Total
Cassava	26	38	75	139
Yam	25	34	76	133
Vegetables	34	46	57	137
Mixed	10	16	30	56
Total	86	127	252	465

Computation of χ_{cal}^2 (table II)

O_i	e_i	$O_i - e_i$	$(O_i - e_i)^2$	$(O_i - e_i)^2 / e_i$
19	26	- 7	49	1.885
31	38	- 7	49	1.289
89	75	14	196	2.613
23	25	- 2	4	0.160
34	36	- 2	4	0.111
76	72	4	16	0.222
34	25	9	81	3.240
46	38	8	64	1.684
57	74	- 17	289	3.905
10	11	- 1	1	0.091
16	15	1	1	0.067
30	30	0	0	0.000
465	465			15.267

from Table II

$$\chi_{cal}^2 = \sum \frac{(O_i - e_i)^2}{e_i} = 15.267$$

From chi square Table $\chi_{0.05}^2(3)(2) = 12.592$.

Decision Rule:

Since $\chi_{cal}^2(15.267) > \chi_{\alpha}^2(12.592)$ H_0 is rejected.

Conclusion: Economic recession will increase food production.

5.0 Summary, Conclusion and Recommendation

We shall summarize and conclude the result obtained from this research work and give recommendations based on the results of this study. The results obtained through chi-square (statistical tool) that led to the rejection of the null hypothesis. Furthermore the data shows there is a steady increase in food production from the year 2014 – 2016.

Conclusively, we have to state that the trend of increase based on the chi-square estimates the impact of Economic recession on food production between the years (2014 – 2016). However, forecasting is not possible with the chi-square, which is a limitation to this method. Thus we conclude that within the year (2014 – 2016) the production level of food has increased due to the Economic Recession. This also means that many have ventured into Agriculture (farming especially).

From the study so far, information on the cause and effect of economic recession on food production has been elaborated and the following recommendations are given below:

1. Government should invest in agriculture because it promotes employment and reduces the cost of living and reduce the nation's recession.
2. Farmers should be encouraged through provision of land, fertilizers, funds (loans, empowerment e.t.c) and teaching series on Agriculture and its importance.
3. Youths that are unemployed should venture into Agriculture in other to be able to afford the cost of living nationwide.
4. Since Agriculture has been seen to be one of the tools that can fight Nigeria's Economic recession, Nigerian's should not hesitate to go into Agriculture at the slightest opportunity.

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