CONTRIBUTION OF AGRICULTURE TO ECONOMIC GROWTH IN NIGERIA

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SSC1608128

BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF ECONOMICS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A BACHELOR OF SCIENCE (B.Sc.) DEGREE IN THE DEPARTMENT OF ECONOMICS IN THE UNIVERSITY OF BENIN, BENIN CITY.

CERTIFICATION

We, the undersigned hereby certify that this project work was carried out by Wosu Lovelyn Chimenem in the Department of Economics, University of Benin City and that it is sufficient in both scope and content in the partial fulfillment of the requirements for the award of Bachelor of Science (B.Sc.) Degree in Economics.

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DEDICATION

To God Almighty, who has given me the grace to journey through this great institution of Uniben, to him alone be all the glory. And to my late father Elder Sampson Wosu,you are always in my heart.To my mother Mrs.Dorathy Wosu,thanks for your prayer,advice and support towards me.God bless you ma.

ACKNOWLEDGEMENTS

My profound gratitude goes to the LORD of all, Jesus Christ for making my academic journey a success.

I give special thanks to my supervisor, Dr. Success Abusomwan for his patience, mentoring and understanding all through this project work. I'm grateful Sir. To this great department of Economics , thanks for bringing out the best in me.

To my mother Mrs. Dorathy wosu, thanks for your advice, prayers and support toward me, God bless you ma. To my wonderful siblings, you are forever a blessing to my life, thanks for everything. To my friends and wellwishers, who contributed in one way or the other to make this journey a success,may God continue to reward you all.

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ABSTRACT

In recent decades, the potential contribution of agriculture to economic growth has been a subject of much controversy among development economists. While some contend that agricultural development is a pre-condition for industrialization, others strongly disagree and argue for a different path. This study examines the contribution of Agriculture to Economic Growth in Nigeria Empolying the Ordinary Least Square Method (OLS).Results shows that the productivity in agricultural sector has not appreciably impacted positively on the economic growth in Nigeria.The research therefore recommends that

CHAPTER ONE

INTRODUCTION

1.9 BACKGROUND TO THE STUDY

Agriculture is concerned with the cultivation of crops and animals for food and other purposes. It is the foundation upon which the development of stable human communities, such as rural and urban communities has depended on in many parts of the world. The study of economic history provides us with ample evidence that an agricultural revolution is a fundamental pre-condition for economic development. The agricultural sector has the potentials to be the industrial and economic springboard from which a country's development can take off. In most low and middle income countries, the agricultural sector remains the largest contributor providing inputs, food, employment, raw materials for other industries, provision of foreign earnings from the exportation of the surpluses, and more importantly the enormous advantage of the value added in the various production process(Izuchukwu,2011) .

The agricultural sector has the potentials to shape the landscape,

provide environmental benefits such as conservation, guarantee sustainable management of renewable natural resources, preserve biodiversity and contribute to the viability of rural areas. Through its spheres of activities at both the macro and micro levels, the agricultural sector is strategically positioned to have a high multiplier and linkage effect on any nation's quest for socio economic and industrial development.

The growth of the agricultural sector in Nigeria has not been smooth. Anyanwu (1967) held that during the colonial period between 1861 – 1960, attention was given to agricultural research and extension services. The first among the activities that were done was the establishment of a research station in Lagos by Sir Claude McDonald in 1893. A landmark of 10.4 km was acquired by the British Cotton Growing Association (BCGA) in 1899 for experimental purposes strictly for cotton and was named Moor Plantation in Ibadan

In 1912, the Department of Agriculture was established in each of the then Southern and Northern Nigeria, but the activities of the department were virtually suspended between 1912 and 1921 as a result of the First World War and its aftermath. The period 1929 and 1945 was a difficult one for the agricultural sector of Nigeria. This was the period of great depression when the world prices on commodities fluctuated. This affected the agricultural sector negatively because the volume of agricultural produce increased but the value did not increase proportionately. The period 1945 – 1954 marked the period of export boom, because countries were just recovering from the Second World War and countries that needed to develop their destroyed industrial sector were many. They depended on primary product for the beginning stage of industrialization. They needed to revitalize their industrial sector by demanding primary goods. Prices of primary products rose higher again because there were speculations that there would be a Third World War due to the outbreak of the Korean War. However, after this period, there came another period of price instability. This made the reliance on agriculture and

its products to fall, leading to the establishment of a market board. This board bought these products from the local farmers and sold them overseas (NEEDS, 2009).

Helleiner (1966) said that in 1929, export production amounted to 57% of Nigeria's revenue and in that 57%, agriculture made up about 80% of the export. On attainment of political independence in 1960, the trend was still very much the same, the Nigerian economy could reasonably be described as an agricultural economy, because agriculture served as the engine of growth of the overall economy (Ogen, 2003), from the stand point of occupational distribution and contribution to the GDP. Nigeria was the world's second largest producer of cocoa, largest exporter of palm oil. Nigeria was also a leading exporter of other major commodities such as cotton, groundnut, rubber and hides and skins (Alkali, 1997). Between 1964 – 1965, agriculture accounted for 55% of GDP and employed 70% of the adult workforce (Matton, 1981). In 1970, agricultural export crops like cocoa, groundnut, cotton, rubber, palm oil, palm kernel, etc. accounted for an average of between 65% - 75% of Nigeria foreign exchange earnings and provided the most important source of revenue for the Federal as well as State governments through export products and sale taxes (Ekundare ,1973), despite the reliance of Nigerian peasant farmers on traditional tools and indigenous faming methods, these farmers produced 70% of Nigeria's exports and 95% of its food needs (Lawal, 1997).

However, the 1967 – 1970 Civil War in Nigeria coincided with the 'Oil Boom' era, which resulted in extensive exploration and export of petroleum and its products. This led Nigeria to neglect its strong agriculture in favour of an unhealthy dependence on

oil (United States Department of State, 2005). Ever since then, Nigeria has been witnessing extreme poverty and insufficiency of basic food items. The agricultural sector contributions now account for less than 5% of Nigeria's GDP (Olagbaju and Fashola, 1996). It is against this back drop that we set out to research on the impact of agricultural development on Nigeria economic growth.

1.2 STATEMENT OF THE PROBLEM

The agricultural sector has suffered from years of poor management, inconsistent and poorly implemented government policies, government neglect and lack of basic infrastructure. Presently, it accounts for 30.77% of GDP, 35% of employment in the economy. Nigeria is no longer a major exporter of cocoa, groundnut, rubber and palm products. Crop production remains the major driver of the sector, accounting for 92.93% of overall nominal growth of the sector in the third quarter (National bureau of statistics, Nigeria 2020).

Because of this backdrop, agriculture has not kept up with the rapid population growth and Nigeria once a large net exporter of food now imports most of its food requirements.Dependence on oil is not the only cause of the under-development of the Nigerian agricultural sector, but also: Falusi and Olayiole (1980) observed that Nigerian agriculture is characterized by illiterate farmers who live in rural areas producing over 90% of the total food consumed and other agricultural products and with regards to their educational status give little or no room for improvement through scientific research.

Olayemi (1985) noted that more than 90% of the consumed food in Nigeria is provided by the small-scale farmers.

Again, the bulk of agricultural activities are done using crude implements which are relatively less efficient when compared with modern machineries such as tractors, ploughs etc. Another problem is the issue of finance. The agricultural sector is poorly financed. They do not get credit easily from financial institutions, like commercial banks. The agriculturists find it difficult to finance projects which are capital intensive. The commercial banks cannot grant loans easily to a small scale farmer because of low produce and low profit which result to a failure in paying back the loan. The lack of storage facilities have led to much wastage and high cost of storage. This hinders the availability of some perishable agricultural produce through the year, thereby hindering agricultural development. Dependence on weather is another problem that affects the increase in agricultural produce. Agriculturists still depend on rainfall to produce instead of the use of irrigation that supply water all through the year.

With all that has been said above, it is obvious that the agricultural sector, being one of the real sectors of the Nigerian economy, has got a lot to contribute to its economic growth. But these are not attainable because of the multifarious problems besieging this sector of the economy.

This work therefore is geared towards answering the patent question:

What impact has the agricultural sector made in the face of the dire need for food security, employment creation and in all increased economic growth of Nigeria?

1.3 RESEARCH QUESTIONS

From the statement of problem above, the following research questions are drawn;

1). what are the causes of decline in agricultural production in Nigeria?

2). what are the impacts of agricultural sector on the economic growth in Nigeria?

3). what are the effects of agricultural sector on employment creation in Nigeria?

1.4 OBJECTIVES OF THE STUDY

The broad objective of this study is to determine the extent to which agricultural development influences economic growth in Nigeria.

1. To determine the cause of decline in agricultural production in Nigeria.

2. To determine the impact of agricultural sector on the economic growth in Nigeria.

3. To determine the effect of agricultural sector on employment creation in Nigeria.

1.5 RESEARCH HYPOTHESES

For the purpose of this study, the following hypotheses are tested;

$H0_1$ - Agricultural development has no significant impact on economic growth in Nigeria.

$H0_2$ - Agriculture development has no significant effect on employment creation in Nigeria.

1.6 SIGNIFICANCE OF THE STUDY

The significance of this work lies on the fact that with improved agriculture, the Nigerian economy stands to gain in its efforts towards development. This study attempts to answer the question; what is the relevance of agriculture in economic growth, the

cause of agricultural decline and how the present state of our agricultural productivity will be improved. This will form the basis upon which suggestions will be made as to how the full potentials of agriculture can be harnessed.

1.7 SCOPE AND LIMITATIONS OF THE STUDY

This study focuses on Nigeria and on the impact of agricultural development on the economic growth of Nigeria. This study covered the relationship between agricultural development and economic growth in Nigeria for a period of 39 years (1980 – 2019).

The originality and reliability of any study or research work is based on the quantity and quality of available data. Though it is the duty and intention of any researcher to bring out and show everything the study is to have, but there are constraints which include, time, finance, and difficulty in getting data.

1.8 STRUCTURE OF THE STUDY

This research work is organized in five chapters; Chapter one is the introduction, which consist of the background to the study, statement of the problem, research questions, objectives of the study, research hypotheses, significance of the study, scope and limitations of the study . Chapter two being the review of the related literature presents the theoretical literature, empirical literature and other areas concerning the subject matter. Chapter three is the theoretical framework and model specification which presents the theoretical framework, model specification and data sources adopted in the study. Chapter four concentrate on the data presentation and analysis. Chapter five gives summary of findings, recommendations and conclusion made of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.4 THEORETICAL LITERATURE

Classical theorists led by Arthur Levis' in 1950s viewed economic development as a growth process of relocating factors of production, especially labor from an agricultural

sector characterized by low productivity and the use of traditional technology to a modern industrial sector with higher productivity. The continuation of agriculture to development was passive. Agriculture acted more as a source of food and labor than a source of growth (Levis, 1954).

The term "Agriculture" has been subjected to different definitions by various experts. As a result Ighodo (1984) defined agriculture as the art and science of the cultivation of crops and rearing of animals for man's use. He also emphasized that agriculture is also the production of fibres for industries, processing of farm produce, packaging and marketing of farm products. This definition is quite embracing as it covers all activities that ensure man's survival.

However, the aspect of research and training that is so vital in production was conspicuously missing in the definition. In order to fill this gap, Ogwuma (1985) defines agriculture as production of field crops, forestry, fishing and livestock, research and training of extension workers. Production is only complete when it gets to the final consumers. It is in response to this economic doctrine that Anyanwu (1987) defined agriculture as involving cultivation of land, raising and rearing of animals for the purpose of providing food for man, feed for animals and raw materials for industries. It involves forestry, fishing, processing and marketing of these agricultural products. Komolafe (1985), Adegoye (1985) and Adubi (2000) defined agriculture as the cultivation of soil for crop production and of looking after animals to produce better meat and other food products and also a process by which farm products are sold.

Kuznet (1973) defined economic growth as a long term rise in the capacity to supply increasingly diverse economic goods to its population. It entails a sustainable rise in national output which is a manifestation of economic growth. To Anyanwu (1997), the role of agriculture in transforming both the social and economic framework of an economy cannot be over-emphasized. In effect, it has been the main source of gainful employment from which the nation can feed its teeming population, providing the nation's industries with local raw materials and as a reliable source of government revenue. According to Adegoye and Dittah (1985), agricultural output can increase the level of income of farmers and the people. They said what constitutes the level of agricultural output will vary with the stage of economic development of a country.

For a purely subsistence economy, agricultural development will occur but not like in a fully developed economy. If there is enough food for the people and a marketable surplus is produced, it will increase the income of the peasants. The increased income generated would so provide means for them to purchase other necessities of life, which they cannot produce themselves. By this means, the standard of living of the peasants will improve and unemployment, underdevelopment will be reduced. They stated that a fully developed economy, especially in agricultural sector, means increase in the production of export crops with an improvement in the quantity and grades of such export crops. For a country that has started to industrialize, agricultural output will be said to have acquired growth if agriculture can supply enough raw materials to the agro-allied industries.

Reynolds (1975), revealed that agricultural development can promote the economic development by increasing the supply of food available for domestic consumption and releasing the labour needed for industrial employment. According to him, agricultural development can promote economic development of underdeveloped countries in four distinct ways:

i. By increasing the supply of food available for domestic consumption and releasing labour needed for industrial employment.
ii. By enlarging the size of the domestic market for the manufacturing sector.
iii. By increasing the supply of domestic savings
iv. By providing foreign exchange earned by the agricultural exports.

Omawale and Rodriguez (1975) opined that for most developing countries, agriculture has been assigned an important role in national development. To them, agriculture has been seen as a means of reducing dependence on certain importations, containing food price increases, earning foreign exchange, absorbing many new entrants to the labor market and increasing farm incomes at times of severe unemployment and rural poverty.

According to Anyanwu, Oyefusi, Oaikhenan and Dimowo (1997), the role of agriculture in transforming both the social and economic framework of an economy cannot be over-emphasized. It is a source of food and raw materials for the industrial sector, it is also essential for expansion of employment opportunity, for reduction of poverty and improvement of income distribution, also for speeding up industrialization

and easing the pressure on Balance of Payment. In effect, it has been the source of gainful employment from which the nation can feed its teeming population, providing the nation's industries with local raw materials and as a reliable source of government revenue. Eyiuche (2005), agriculture provides the nation with the bulk of employment. Notwithstanding the rural to urban migration, stagnating agricultural productivity, the agricultural sector played and still plays the important role of providing majority of Nigerians with gainful employment. Industrial sector of the economy, especially petroleum, mining, even though they contribute over 90 per cent of the present GDP, they provide a very small percentage of our people with employment. Olatunbosun (2009) was of the view that the agricultural sector has the potential to be the industrial and economic springboard from which the country's growth and development could take off.

Byerlee, Diao and Jackson (2009) are of the view that agriculture is an "engine of growth" in the early stages of development because of its high share of economic activities and its strong growth linkages with the rest of the economy. They also believe that agriculture can serve as a safety net in times of macro-economic crisis. "Agriculture can manage shocks and vulnerability at both the macro level and household level. Beyond direct contribution to growth, a number of features specific to the sector enhance its contribution to growth: the large size of its growth linkages to other sectors and the positive externalities from assuring food security and reducing food prices."Adubi (2000) is also of the view that agriculture can finance the development process of Nigeria by providing revenue to the government. According to him, regional governments derived

much of their development finances from agriculture. Between 1954 and 1957, ₦144 million of the Marketing Board surplus were disbursed as grants to regional government and another ₦124 million as loans to regional governments. Between 1962 and 1966, 13 to 34 percent of regional government finances depended on the Marketing Board surpluses.

According to Kwanshie, Agilima and Garba (1998), Agricultural export was the engine of growth prior to 1973, providing much of the revenue that the government used in developing a basic infra-structural system and also financed the import substitution industrialization programme. According to Ajaero (2009), Agriculture contributed more than 60 per cent of the GDP in the 1960s despite the reliance of the Nigerian farmers on traditional tools and indigenous farming methods, they produced enough to feed the entire nation and generated enough revenue, the surplus of which was used by government to develop the basic infrastructure needed for long term development.

According to Kuznet (1966), there are major characteristic features manifested in the growth process of most developed nations. One is a sustainable increase in the rate of growth of per capital output, income and population. Secondly is the high rate of increase in total factor productivity especially labour productivity. Thirdly is the sustained rise in the rates of structural change which entails a gradual shift from agricultural to non-agricultural activities. This is in line with Rostow's five stages of development. According to Rostow, a nation must first pass through the traditional primitive stage which is characterized by high agricultural activities. The economy is dependent on the

agricultural sector, thus agriculture serves as the foundation for economic growth, without the development of this sector, the economy is bound to have a shaky growth. An economy cannot grow neither can it develops while harboring a community of hungry people as this people can contribute nothing towards national output.

Malthus (1766 – 1734) states that "food is necessary to the existence of man". According to him, food production increases at a slower rate than population. He is therefore relating availability of food with population. If population increases faster than food production, then the economy is tending towards starvation making economic growth impossible. Malthus clarified the key relationship necessary for betterment of human condition: "Production of food had to increase faster than population if there was to be any major improvement in living standards."

According to Thirlwall (1977), agricultural development can promote the economic growth and development of economies of underdeveloped countries in these ways: Providing in large measure, the factor supplies for industry; Providing food for an urban industrial population; Enlarging the size of domestic market; Increasing rural income to be mobilized by the state; Improving the standard of living of rural people; Providing productive employment, etc.

Udabah (2007) opined that the transformation from a subsistence agriculture to modern agriculture leads to the development of industries. Once agriculture emerges from its stagnatory, subsistence state and starts to specialize and produce goods for exports and industry develops, the two sectors; agriculture and industry become very

much inter-dependent. The industrial sector adds to the demand for goods produced by agricultural sector and absorbs surplus labour which may raise productivity in agriculture. The agricultural sector in turn provides an outlet for industrial goods out of rising real income and makes a factor contribution to development through the release of resources i.e. if productivity rises faster than the demand for commodities. Adelman (2001) emphasizes that agriculture is integral to any thinking about growth and development since the sector constitutes a large share of national output and often employs a majority of the labour force in most developing countries.

According to Thirlwall (1972) "the quality of land can affect the level of agricultural productivity in the early stages of economic development and the importance of agricultural development in turn can be clearly seen within the production function framework. Rising agricultural productivity permits the release of labour from agriculture to industry which in turn leads to increasing returns, rising income per head and greater capital accumulation. Given the dominance of the agricultural sector in the economic structure of developing countries, such factors as the physical attributes of land (topography, fertility etc.), the land tenure system, the ratio of labour to land and the extent of natural resource endowments are likely to exert a major influence on the speed of development as determinants of the pace of agricultural advancement and the pace of industrialization based on a healthy agricultural sector or the exploitation of indigenous resources.

The agricultural sector must provide, in large measure, the factor supplies for industry, it must provide food for an urban industrial population and it must contribute to the market for industrial goods if the demand for goods is to be sufficient to justify their production domestically. For the agricultural sector to release labour, to provide savings, to supply food and to contribute to the market for industrial goods, it must generate a steady surplus of production in excess of subsistence needs. Agriculture therefore remains the major sector of every developing economy. Development must start first with the development of the agricultural sector because most poor people earn their living from agriculture.

According to Timmer (1988): Because agriculture forms a large share of national output and employment in the early states of development, this sector is explicitly treated in most theories of economic development. These theories have evolved over time, but generally can be divided into two: The classical view of the 1950s and 1960s of agriculture as a passive contributor to economic growth and development and the agricultural led industrialization school of the 1970s and 1980s.

2.4.1 Agriculture as A Passive Contributor to Economic Development (Classical School of 1950s And 1960s)

Classical theorists led by Arthur Lewis in the 1950s viewed economic development as a growth process of relocating factors of production, especially labour from an agricultural sector characterized by low productivity and the use of traditional technology to a modern industrial sector with higher productivity. The contribution of

agriculture to development was passive. Agriculture acted more as a source of food and labour than a source of growth (Lewis, 1954).

Although, passive agricultural development was seen as necessary for successful economic transformation for two reasons:

i. To ensure the supply of food and prevent rising food prices and real wages from undermining industrial development and

ii. To utilize land as an additional "free" source of growth that would not compete with resources for industrial growth, Lewis, (1954).

2.1.2 Agricultural Led Industrialization (Classical School of 1970s and 1980s)

Beginning in the 1960s, a major revision in development thinking argued for a central role for agriculture as a driver of economic growth, especially in the early stages of industrialization (Johnson and Mellor, 1961; Schultz 1964). This view of agriculture as having an active role was founded on two contributions:

i. It was recognized that traditional agriculture could be transformed rapidly into a modern sector through the adoption of a science-based technology, thereby making a large contribution to overall growth.

ii. Economists now identified the strong growth linkage and multiplier effects of agricultural growth with the non-agricultural sectors. Agriculture has strong direct forward linkages to agricultural processing and backward linkages to input-supply industries(Johnston and Mellor, 1961).

2.1.3 Agricultural Linkages and Economic Growth and Development

Hayami and Ruttan (1985) revealed that agricultural productivity growth requires fostering the linkages between the agricultural and non-agricultural sectors.According to Adelman (1984), because of the strong growth linkage effects, agricultural development can lead to a wider economic growth in many countries even open economies during the early stages of industrialization. Godoy and Dewbree (2010) are also of the view that agricultural development plays a vital role in poverty reduction and economic transformation. Agricultural growth reduces poverty through direct impacts on farm incomes and employment while indirect impacts are through linkages.

The importance of inter-sectorial linkages in driving the growth process had already been widely recognized. Hirschman (1958) was one of the theorists to emphasize linkage effect in the growth process although his analysis focused mainly on the backward and forward linkages created by investment in industrial sectors. By contrast, Johnson and Mellor (1961) emphasized the existence of production and consumption linkages both within agriculture as well as between agriculture and non-agriculture. In particular, non-agricultural production generates forward linkages such that agricultural outputs are supplied as inputs into non-agricultural production.

Growth in agriculture contributes to rapid rise in agro processing and processed food marketing, which not only provides new engines of growth but an opportunity to substitute for imports. Agriculture also creates backward linkages through its demand for intermediate inputs such as fertilizers and marketing services. Both of these production

linkages are likely to deepen as an economy modernizes, but decline in relative importance alongside agriculture's share of production (Haggblade, 1989).

According to Hazzell and Roell (1983), the consumption linkages generated by increased rural incomes is agriculture's most important linkages in the development process. Rural households, especially during the early stages of development provide an important market for domestically produced goods and services. Without this market, it is unlikely that sufficient export opportunities will allow fledging domestic industries to achieve competitive efficiency in foreign markets through economies of scale. Hart (1998) was of the view that surplus agricultural income provides savings for investment in both urban and rural areas. This savings linkage also works through forward linkages to urban areas. Lower food prices, stimulated by technological changes in agriculture, maintain low wages in industrial sectors and thus foster investment and structural transformation.

Lewis (1954) was of the view that industrial and agricultural revolutions always go together and economies in which agriculture is stagnant do not show industrial development. This is in tune with the observations of the classical theorists that most developing countries are comprised of "dual" economies. In their view, labour productivity is typically lower in agriculture than in industry and hence, development requires the movement of agricultural labor into non-agriculture. While non-agricultural innovation and technological change can occur independently of the agricultural sector, both labor and savings must be released from agriculture in order to satisfy labor demand and finance capital investment in industry.

Beyond agriculture providing a “reserve army” of labor, classical economists also highlighted the importance of food supplies in stimulating economic growth. If traditional agriculture remains stagnant, then increased employment in the non-agricultural sector may result in food shortages. Food price increases would raise the cost of living, especially for low income households with high food consumption shares. The pressure to raise wages would hamper industrial growth especially during the early stages of development when technologies are typically labor-intensive. Increased labor costs will eventually drive the economy into a stationary state without further growth. This is the famous “Ricardian Trap” which formed the foundation for subsequent development theorists (Schultz 1953, Lewis 1954, Fei and Rani 1961 and 1964 and Jorgenson 1961).

According to Hayami (2001), “these theorists understood that successful industrialization cannot be expected without the parallel effort of increasing food production to avoid the danger of being caught in the “Ricardian Trap”.Hence, industrialization attempts revealed that agricultural and non-agricultural growth could not occur independently of each other.”

2.1.4 Problems Associated with Agricultural Development

Agriculture in Nigeria is a branch of the economy in Nigeria, providing employment for about 35% of the population as of 2020. As reported by the FAO; Agriculture remains the foundation of the Nigeria economy, despite the presence of oil in the country. It is the main source of livelihood for most Nigerians. The Agricultural sector is made up of four sub sectors; Crop Production, Livestock, Forestry and Fishing.

In the third quarter of 2019, the sector grew by 14.88% year-on-year in nominal terms with a decline of 3.44% points from the third quarter of 2018. The largest driver of the sector remains crop production as it accounts for 91.6% of the sector in the third quarter of 2019 with a quarterly growth which stood at 44.12%. The agriculture sector contributed 29.25% to overall real GDP during the third quarter of 2019. The exportation sector's monthly earns improved in four years. In January 2016, agricultural exports ranked in N4.1 billion which then rose to 25 billion by January 2017. From April 2019 to march 2020, total agricultural exports hit N289 billion for Nigeria. Agriculture exports for the first six months of 2020 were N204.45 billion, which concerns that productivity is increasing in the sector to enable export growth.

From planting to harvesting and consumption/commercialization, different constraints have made farming difficult for farmers in Nigeria. In 2018, the minister of agriculture and rural development, chief Ogbe mentioned that about 30%-40% of the foods produced in Nigeria are ultimately wasted. This means that the problems stem beyond the farming process as issues such as wastage can still hinder successful Agriculture. Agriculture in Nigeria has the potential to generate more if we can tackle the problems head on instead of looking for short fixes. The problems are: lack of modernization/mechanization; lack of information; poor infrastructure; poor research and record keeping; finance.

The place of agriculture in Nigeria’s economy has remained critical over the decades since her political independence. As documented by Anyanwu (1997)

agricultural sector played a dominant role in the generating of large proportion of the nation's Gross National Product (GNP) in the 1960s. She asserted that agriculture accounted for over 42 percent of commodity export earnings and about 74 percent of total government revenue within the period under review. Corroborating with the above is Obadan (2000), when he observed that the production of the agricultural products from independence to the early 1970s accounted for 96.4 percent of total export earning while non-oil export products accounted for 97.3 percent of total exportation.

However, this situation changed drastically at the beginning of the 1970s. Agricultural output started to decline rapidly at a time which not only coincided with the end of Nigeria Civil War, but also with the period of Oil Boom of 1970s and severe drought of 1977 (UK Pong, 1991). The overall agricultural situation deteriorated, creating wide gap between the supply and demand for food. Revenue from agricultural export declined and government was faced with mounting food import bills. Industries at the same time increasingly resorted to importation of agricultural raw materials, thus putting a lot of stress on Nigerian foreign exchange (Malgwi, 1986). Nigeria, once a major exporter of certain food commodities such as cassava, groundnut, palm oil and palm kernel, etc, now is a major importer of food commodities. From the year 2001 to 2007, Nigeria imported a total of 160,209.10 in 2001, 138.993.52 in 2002, in 2003 146,1225.3, 147.380.40 in 2004, 193,259.09 in 2005, 235,440.18 in 2006 and 290,650.89 in 2007 worth of food and live animals (CBN Annual Report and Statement of Accounts, 2007).

Myrdal (1970) considered the underutilization of labour in rural areas as well as the phenomenon of rural-urban migration as inhibitive to increased and quality agricultural outputs in Nigeria. There are many inhibitive variables to agricultural output of which the major problem according to Myrdal is government neglect of the agricultural sector. Schultz (1964) argued that low productivity of farm labor is due more to an absence of specific factor inputs, such as research and education, than to shortage of reproducible capital. He contends that the most practical and economical approach to achieving sizeable increase in agricultural productivity lies in enhancing the efficiency of the existing agricultural economy through improvements in the quality of inputs and by the application of advances in knowledge and modern technology.

Aromolara (1971), observed that in most of the under-developed countries, the farm size range from 5 -11 acres. Based on his report, the smallest of the operating unit precludes the use of modern equipment on economic basis. Williams (1984), noted the lack of credit facility as one of the major factors limiting increased agricultural output. He observed that, as it is true of any business, credit and investment are very important to the growth of output and agriculture. He said that it is lack of credit facilities which has kept many farmers from adopting improved practices since most of them lack tangible collaterals to be accepted against loans.

According to Okonkwo (1989), since the discovery of crude oil in Nigeria, “the non-oil export sector of the economy, more specifically, the agricultural sector, has been declining consistently with further increases in oil exports”. Onucheyo (2009) believed

the advent of the Oil Boom to be the major problem of agriculture as people migrated from rural to urban areas in attempt to reap from the windfall from oil. In his words "you didn't have to farm to eat anymore, as a Nigerian, all you just needed to do was to come with your bowls to the nation's capital city and collect your own share of oil money. So people felt it was no longer necessary to farm".

Anyanwu (2009) shares the views of Onucheyo on this issue. He believes that the decline in agricultural products in Nigeria began with the advent of petroleum. He noted that as food production could not keep pace with increased population, Nigeria became a net importer of food while loosing its status as the world's largest producer of palm oil, palm kernel and cassava. Balogun (2009), the poor performance of agricultural sector and production can be blamed on poor management of public resources, inappropriate incentives and more fundamentally, structural factors especially technological constraints. He also opined that agriculture has suffered because of mass migration. Few numbers of able young people are left behind in the rural areas to carry out farming activities thereby reducing agricultural productivity. Idachaba (2004) argued that the dwindling agricultural production in Nigeria is a confirmation of the unattractiveness of agriculture as a result of low returns and compensation being paid to farmers which tend to discourage increased production.

Olayemi (1982) observed that food is a very important but rather neglected aspect of agricultural development. More emphasis is usually placed by government on policies to increase food production with little or no consideration on how to distribute food

produced efficiently in a manner that will increase food productivity. In other words; food marketing by farmers mostly in the immediate post-harvest period usually involves a lot of costs and in Nigeria, these costs are so high that lowering the costs through efficient marketing system may be as important as increasing agricultural production (Ahmed and Rustagi, 1987).

As Reardon et al (1998) pointed out, the main agricultural environmental associated problem relate to population pressure on natural resources and this includes:

i. Soil erosion and loss of fertility as small holders seek to intensify production by adding labour to existing agricultural land without corresponding increase in capital (chemical, organic inputs, land conservation and infrastructure).
ii. Loss of biodiversity and the damage of natural ecosystems as small holders seek to enhance agriculture production by clearing forests and expanding into fragile ecosystems.

According to Ojuneye (2010), some major problems confronting Nigeria agriculture are poor infrastructural facilities such as poor feeder roads and road network, storage facilities, rural electrification, poor manpower development, socio cultural factor like the land tenure system, poor Government/Regulatory policies.

2.2 EMPIRICAL LITERATURE

Using Social Accounting Matrices, Vogel (1994) examined the strength of agriculture as a factor of growth for 27 countries. He discovered that agriculture through

its linkages leads to positive integration of the sector with the broader economy and in all 27 countries, agriculture served as a great source of economic growth in the early stages of development and its significance begins to diminish as the countries started advancing industrially.

Work by Gollin et al (2002) showed the importance of agriculture in the early stages of development. Analyzing data for 62 countries for the period 1960 – 1990, the authors found that growth in agricultural productivity was quantitatively important in understanding growth in GDP per worker. Both the cross-section and Panel data analyses showed that countries experiencing increases in agricultural productivity were able to release labour from agriculture into other sectors of the economy.

2.2.1 Causes of Decline in Agricultural Production in Nigeria

At Nigeria's Independence in 1960, agriculture was the mainstay of the Nigerian economy. According to Ilugbuhi (1968), peasant agricultural production to export provided the stimulus to Nigeria's overall economic growth. Agriculture provided employment to over 75% of the population and accounted for over 70% of total food consumption (Reynolds,1966). It also provided raw materials for industry, export earnings to finance imports and foreign exchange (Alamu,1981).

Nigeria has an agrarian economy before the advent of oil in the late 1970's. At the peak of the oil boom, Abdullahi (1981) observed: Nigeria can no longer produce enough food for its fast growing population neither could the agricultural system cope with the increasing demands of the agricultural raw materials to keep the country's oil mills,

textile and other agro based industries operating at full capacity let alone have surpluses for export. According to Ogundari and Ojo (2007), Nigerian agriculture is characterized by: a multitude of small scale farmers ranging from 0.05 to 3.0 hectares per farm land scattered over wide expanse of land area, rudimentary farm systems, low capitalization and low yield per hectare. The role of agriculture remains significant in the Nigerian economy despite the strategic importance of the crude oil sector

The decline in the contribution of agriculture to the GDP of developing countries especially Nigeria overtime is due to the slower growth of the sector relative to other sectors of the economy and most especially, commercial exploration of petroleum (CBN,2008). The daunting obstacles to agricultural development causing decline of food production is upland farming systems, especially in Nigeria for example, has often been attributed to poor rural infrastructure, poor market access and transport cost weak institutions to support agriculture(Hazell,2005). Hazell,(2005) further emphasized that modern farming technology are either not accessible or simply not economical to adopt. In terms of soil improvement, limitation seems to be the Farmer's inability to replenish nutrients lost in the continuous cultivation which has replaced the traditional bush fallow system.

2.2.2 Impacts of Agricultural Sector on the Economic Growth in Nigeria

Agriculture is the bedrock of economic growth, development and poverty eradication in the developing countries. Agriculture has been regarded as the engine and panacea to economic prosperity. Gunner, (1984) explained that the battle for long term

economic growth will be won or lost in the agricultural sector. However, how this route leads to economic growth is still under debate among researchers. The questions as to whether agriculture is a viable engine of economic growth issues have been raised. In response to this question, Lavorel et al (2013) investigated the relationship between agricultural productivity and economic growth in 85 countries that comprises developed and developing countries, using agricultural value added per worker and gross domestic product (GDP) per capita as key variables. The findings revealed a relationship between agricultural valued added and economic growth only in the developing countries, while the results for the developed countries remain ambiguous.

According to Kuznetz (1973), Abayomi (1997), agricultural sector has four major contributions to the development of an economy; Product contribution, factor contribution, market contribution and foreign exchange contribution. Agriculture is a source of food and raw materials in the industrial sector; it provides raw materials for industrial use for speeding up industrialization. It involves production of crops, livestock and forestry, fishery, for man's consumption and use; processing and marketing of the agricultural products. These contributions in effect have been the source of gainful employment opportunities with attendant implications for poverty alleviation and improvement of income distribution. Also, foreign earnings from exportation of agricultural local materials, has played a significant role in reducing the pressure on balance of payment in most African nations. Based on these contributions, agriculture is

regarded as the fundamental to the socioeconomic development of a nation (Ahmed, 1993)

In most low and middle income countries, the agricultural sector remains, the largest contributor providing inputs, food, employment opportunities, raw materials for other industries, provision of foreign earnings from the exportation of the surpluses, and more importantly, the enormous advantage of the value added in the various production process (Izuchukwu, 2011). Thus, the role of agriculture in transmuting both the social and economic structures of an economy cannot be over emphasized. Rostow(1960) argued that in the process of economic development, nations pass through several stage, namely: traditional stage ,the precondition for take-off, the take off stage, drive to maturity and the high mass consumption stage. Agriculture played crucial roles in the first three stages (Traditional society, preconditions for take-off and take off stages). The agricultural sector has the potential to be the industrial and economic springboard from which a country's development can take off.

Indeed, more often than not, agricultural activities are usually concentrated in the less developed rural areas where there is a critical need for rural transformation, redistribution, poverty alleviation and socioeconomic development. Based on the historical experience of western countries, economic development was seen as requiring a rapid structural transformation of the economy focused on agricultural activities to a more complex modern industrial and service society. As a result, agriculture's primary role is to provide food and manpower to the expanding industrial economy. Reynolds

(1975) revealed that agricultural development can promote the economic development by increasing the supply of food available for domestic consumption and releasing the labour needed for industrial employment. According to him, agricultural development can promote economic development of underdeveloped countries in four distinct ways: by increasing the supply of food available for domestic consumption and releasing labour needed for industrial employment; by enlarging the size of the domestic market for the manufacturing sector; by increasing the supply of domestic savings and by providing foreign exchange earned by the agricultural exports. Omawale and Rodriguez (1980) opined that for most developing countries, agriculture has been assigned an important role in national development. This is because, agriculture has been seen as a means of reducing dependence on certain importations, containing food price increases, earning foreign exchange, absorbing many new entrants to the labor market and increasing farm incomes in times of severe unemployment.

Nigeria economy in past decades was reputed as the mainstay of the economy, especially in the early 1960's . It was seen as the key driver for growth and development. Agriculture was the backbone of the Nigeria economy at independence in 1960 as it accounted for over half of the Gross Domestic Product (GDP) (Olagunju, 2007). The sector contributed about 55% of gainful employment and almost 40% of the share of GDP before the discovery of oil. This GDP share of agriculture sector is quite high when compare with the average of 27% for low income nations in sub-Sahara Africa (WDI, 2010). But with the oil boom in the early 1970's successive governments abandoned and

neglected the agricultural sector completely and since then; poor performance characterized the Nigerian agricultural sector. The role agricultural sector plays in the region and economic development of the country have diminished over the years. In spite of this, the sector still accounts for about 40 percent of GDP and provides employment, both formal and informal, for about 60 percent of Nigerians 144 millions of people (Olagunju, 2007 and Odoemelam, 2011). The growth rates of agricultural productivity usually calculated as the difference between output growth and the growth of labour and capital weighted by their share have been increasing at a decreasing rate. One of the reasons for this poor performance of the agricultural sector is that majority of farmers in Nigeria are still engaged in primitive and traditional methods of agricultural production. Farming machinery everywhere is very primitive

CHAPTER THREE

THEORETICAL FRAMEWORK AND MODEL SPECIFICATION

3.1 THEORETICAL FRAMEWORK

The theory with the classicalist view more relevant to this study is Harrod Domar growth theory. The model as opined by Bhagwatti became significantly influential in development economics literature during the third quarter of the twentieth century and was a primal component within the framework of economic planning. The central development problem was simply to stimulate resources devoted to investment (Bhagwatti, 1984). The model is of the view that economic growth is achieved when more investment leads to more growth. The theory asserts that for an economy to maintain full employment in the long-run, net investment must increase continuously as well as growth in the real income at a rate sufficient enough to maintain full capacity utilization of a growing capital stock. The production function is given as:

Y=k (1)

Where Y is output, K is capital stock, is the capital coefficient. The production function implies that labour is surplus, that is, capital is the only scarce factor of production.

However, it follows that any addition to capital stock in the form of new investment will bring about corresponding augmenting of the national output flow; this relationship is known as capital-output ratio. If we define our capital-output ratio to be k and take further that the national net saving ratio, s is a fixed proportion of national output and that the total new investment is a function of the level of total savings. Thus, economic growth model can be constructed, net savings (S) in some proportions of national income (Y) such that we then have:

$$S=sY \qquad (2)$$

Net investment can be defined as the change in the stock of capital, K and represented by ΔK:

$$I=\Delta K \qquad (3)$$

But given the fact the total capital stock, K bears a positive relationship to national income, Y as depicted by the capital-output ratio, k. it follows that:

$$K=k$$

Or,

$$\Delta K=k$$

$$Y=\Delta K$$

Or,

$$\Delta K=k\Delta Y \qquad (4)$$

Because net national savings, S must be equal to net investment, I we can write this equality as:

$$S=I \quad (5)$$

But from equation (5) we know that S=sY, and from equation (2) and (3);

$$I=\Delta K=k\Delta Y$$

The identity of savings equals investment in equation (5) could be written as:

$$S=sY=k\Delta Y=\Delta K=I \quad (6)$$

Or simply as:

$$sY=k\Delta Y \quad (7)$$

Dividing both sides of equation (7) first by Y and then by K, we get:

$$\Delta Y/Y=s/k \quad (8)$$

Where $\Delta Y/Y$ shows the rate of growth of GDP (i.e. output or income)

Equation (8) states that the rate of growth of GDP is determined jointly by the net national saving ratio, s (i.e. s=S/Y), and the national capital-output ratio, k (i.e. k=K/Y). In the absence of government intervention, the rate of growth of national income will be directly related to the savings ratio that is, the higher the economy is able to save and invest out of a given GDP, the greater the GDP growth, and indirectly related to the economy's capital-output ratio. For an economy to witness sustainable economic growth, it must save and invest a certain proportion of its GDP.

3.2. MODEL SPECIFICATION

The methodology adopted in this study is the linear regression employing the technique of ordinary least square (OLS). The choice of OLS is guided by the fact that it has optimal properties which include, linearity, neutrality, sufficient least variance and

mean square error. These desirable properties of estimators can be obtained from any techniques but minimum variance property distinguishes the ordinary least square (OLS) estimators as the best when compared with other linear neutral estimators from econometric techniques. This particular property of smallest variance is the reason for the popularity of the OLS method (Koutsoyiannis 1997).

This research shall employ econometric method. According to Modalla (1992), this method gives the best techniques for the verification and refutation of theories. It also provides qualitative estimation of the relationship among variables without much subjective judgment. The specification of econometric model is always based on economic theory or any available information relating to the phenomenon being studied (Koutsoyiannis 1997). Hence, the specification of the models adopted for this investigation is implicitly stated as follows:

Model to be estimated for objective two

ECGT = F (AGD, CPA, INF, RIR)

$$ECGT = \alpha o + \alpha_1 AGD + \alpha_2 CPA + \alpha_3 INF + \alpha_4 RIR$$

$$\alpha_0 > 0, \quad \alpha_1 > 0, \quad \alpha_2 > 0, \quad \alpha_3 > 0 \quad \text{and} \quad \alpha_4 > 0$$

Where:

ECGT = Economic Growth.

AGD = Agricultural Development.

CPA = Capital Accumulation.

INF = Inflation Rate

RIR = Real Interest Rate.

e = A Stochastic error term.

e is a variable representing other factors that may determine agricultural output which are not captured in the model:

α_0 = Autonomous agricultural outputs.

α_1, α_2, α_3, α_4 = Parameters of the slope.

Model to be estimated for objective three

LPR = F (AGD, CPA, INF, RIR)

$$LPR = \alpha o + \alpha_1 AGD + \alpha_2 CPA + \alpha_3 INF + \alpha_4 RIR$$

$$\alpha_0 > 0, \quad \alpha_1 > 0, \quad \alpha_2 > 0, \quad \alpha_3 > 0 \quad \text{and} \quad \alpha_4 > 0$$

Where:

LPR = Labour Force Participation Rate which is used to proxy the level of employment creation in Nigeria.

AGD = Agricultural Development.

CPA = Capital Accumulation.

INF = Inflation Rate

RIR = Real Interest Rate.

e = A Stochastic error term

e is a variable representing other factors that may determine agricultural output which are not captured in the model:

α_0 = Autonomous agricultural outputs.

α_1, α_2, α_3, α_4 = Parameters of the slope.

3.3 DATA SOURCES

This study is majorly based on secondary data on selected models and for the other control variables mentioned in the model from Central bank of Nigeria (CBN) Statistical Bulletin, and World Development indicators covering the period from 1980-2019. The data utilized consists of annual observations on Gross domestic product, food imports, food production, consumer price index, exchange rate, and total population.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 INTRODUCTION

The focus of this chapter is on data presentations and analysis of results. Specifically, it includes: descriptive statistics, test for stationarity, test for co-integration, model estimations, discussion and findings, diagnostic test, policy implications.

4.1 PRELIMINARY RESULTS

4.1.1. Descriptive Statistics

The table 4.1 below depicts the (mean, mode, minimum and maximum value, standard deviation.) of the variables ECGT, LPR, AGD, CPA, INF, RIR:

Table 4.1: Summary Statistics for the Variables

	ECGT	LPR	AGD	CPA	INF	RIR
Mean	3.506620	4.155883	3.089971	3.468613	2.671420	3.472704
Median	3.614658	4.162634	3.085715	3.563678	2.516796	4.622027
Maximum	33.73577	4.215559	3.609974	4.492965	4.288265	5.723847
Minimum	-13.12788	4.075264	2.419993	2.651037	1.684545	-0.634878

Std. Dev.	7.174540	0.035084	0.235927	0.545701	0.685918	1.992927
Observations	40	40	40	40	40	39

Source: Author's Computation Using E-views 9.0.

From the table, the mean values of ECGT, LPR, AGD, CPA, INF, RIR are given as follows: 3.51, 4.16, 3.09, 3.47, 2.67, 3.47 respectively and their median values are given respectively as follows: 3.61, 4.16, 3.09, 3.56, 2.52, 4.62 respectively and their standard deviation values are also shown in table as: 7.17, 0.04, 0.24, 0.55, 0.69, 1.99 respectively. The table above also shows that mean, standard deviation, median values falls between the minimum and maximum values. The table also shows that there are 40 observations captured in the study.

4.1.2. Test for Stationarity

By Stationarity we mean that the statistical properties of a a time series (or rather the process generating it) do not change over time. Using Augmented Dickey Fuller Approach, the unit root tests is given below as:

Table 4.2: Unit Root Test

Variables	**ADF Statistics**	**MacKinnon Critical**	**ADF Statistics**	**MacKinnon Critical**	**Order of Integration**

	(level)	Values at 5%	(1st Difference)	Values at 5%	
ECGT	-4.72	-2.94	-9.97	-2.94	I(0)*
LPR	-2.04	-2.94	-3.93	-2.94	I(1)**
AGD	-3.16	-2.94	-4.99	-2.94	I(0)**
CPA	-1.65	-3.53	-4.69	-2.94	I(1)**
INF	-3.05	-2.94	-6.31	-2.94	I(0)*
RIR	-2.32	-2.94	- -5.15	-2.94	I(1)**

Source: Author's Computation Using E-views 9.0.

From the table 4.2 above, it can be seen that the variables ECGT, AGD and INF were all stationary at I (0) while variables LPR, CPA, RIR were all stationary at first difference at 5% significant level and so ARDL technique is most appropriate for the short run analysis since stationarity is of different order.

4.2 TEST FOR CO-INTEGRATION

Co-integration is an econometric test that allows you to estimate the long-run parameters or equilibrium in systems with unit root variables. The test results are given below as:

TABLE 4.3a: Co-integration test (Trace test)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.763323	106.9346	69.81889	0.0000
At most 1 *	0.502021	55.05647	47.85613	0.0091
At most 2 *	0.360476	29.95739	29.79707	0.0479

At most 3	0.261293	13.86425	15.49471	0.0867
At most 4	0.078972	2.961532	3.841466	0.0853

Source: Author's Computation Using E-views 9.0.

In the table above 4.3a above, it can be seen that the trace test indicates 2 co-integrating equations at 0.05 significant level. This indicates there exists a co-integrating relationship among the variables captured by this study and so there exists a long run relationship among the variables.

TABLE 4.3b: Co-integration test (Max-Eigen test)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.763323	51.87815	33.87687	0.0001
At most 1	0.502021	25.09909	27.58434	0.1007
At most 2	0.360476	16.09313	21.13162	0.2194
At most 3	0.261293	10.90272	14.26460	0.1591
At most 4	0.078972	2.961532	3.841466	0.0853

Source: Author's Computation Using E-views 9.0.

In the table above 4.3b above, it can be seen that the Max-Eigen test also indicates 1 co-integrating equations at 0.05 significant level. This indicates there exists a co-integrating relationship among the variables captured by this study and so there exists a long run relationship among the variables.

For hypothesis one: Agricultural development does not have a significant impact on Economic growth in Nigeria.

4.3. DISCUSSIONS AND FINDINGS

4.3.1 The Short Run Model

The table below shows the OLS regression results regressing ECGT on the independent variables AGD, CPA, INF, RIR. The table also shows the significant or non-significant level of impact these independent variables on ECGT.

Table 4.4a: Ordinary Least Squares model

Dependent variable*:* ECGT

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGD	20.58965	9.757780	-2.495181	0.0457
CPA	-2.045760	4.551108	-0.449508	0.6564
INF	0.116459	1.409417	-0.082629	0.9347
RIR	8.563105	3.345514	-2.559578	0.0160
C	-46.95257	20.11449	-2.334266	0.0267
R-squared	0.709284	Mean dependent var		4.060429

Adjusted R-squared	0.390835	S.D. dependent var	6.868094
S.E. of regression	5.360480	Akaike info criterion	6.384794
Sum squared resid	833.3076	Schwarz criterion	6.733101
Log likelihood	-110.1187	Hannan-Quinn criter.	6.507589
F-statistic	4.299615	Durbin-Watson stat	2.251542
Prob(F-statistic)	0.002275		

Source: Author's Computation Using E-views 9.0.

From the above table 4.4a, it can be seen that the level of agricultural development is positively related to the dependent variable economic growth in the short run. This implies that one percent increase in agricultural development in Nigeria will result in 20.59 percent increase in current level of economic growth. The results above show that agricultural development is a statistically significant factor affecting current level economic growth in Nigeria at 5% level of significance.

From the above table 4.4a, it can be seen that the level of capital formation is negatively related to the dependent variable economic growth in the short run. This implies that one percent increase in capital formation in Nigeria will result in 2.04 percent decrease in current level of economic growth. The results above show that capital formation is a statistically significant factor affecting current level economic growth in Nigeria at 5% level of significance.

From the above table 4.4a, it can be seen that the level of Inflation is positively related to the dependent variable economic growth in the short run. This implies that one percent increase in Inflation in Nigeria will result in 0.11 percent increase in current level of economic growth. The results above show that Inflation is a statistically insignificant factor affecting current level economic growth in Nigeria at 5% level of significance.

From the above table 4.4a, it can be seen that the level of real interest rate is positively related to the dependent variable economic growth in the short run. This implies that one percent increase in real interest rate in Nigeria will result in 8.56 percent increase in current level of economic growth. The results above show that real interest rate is a statistically insignificant factor affecting current level economic growth in Nigeria at 5% level of significance.

The coefficient of determination (R^2) showed that, about 70% of the systematic variations in the explained variable are accounted for by the joint influence of all the explanatory variables employed in the study, while the remaining 30% is due to other factors captured by the error term. This further confirms that the model is correctly specified. The F-statistics indicate a rejection of the null hypothesis of joint insignificance (at 5% significance level). In other words, we are about 95% confident that the explanatory variables are simultaneously significant when addressing the various factors that influence economic growth in Nigeria. The Durbin Watson statistic which is approximately equals 2 indicating that autocorrelation is absent in the estimated model, this makes the estimated model reliable and fit for policy perspective.

4.3.2 The Long Run Model

Table 4.4b: Long run model

Dependent variable: ECGT

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-60.37704	19.43941	-3.105908	0.0039
AGD(-1)	20.13500	6.202702	3.246166	0.0027
CPA(-1)	-0.543370	4.462065	-0.121775	0.0038
INF(-1)	1.016700	1.409571	0.721283	0.4758
RIR(-1)	0.181433	1.395634	0.130001	0.8974
R-squared	0.500574	Mean dependent var		3.608105
Adjusted R-squared	0.395189	S.D. dependent var		7.326017
S.E. of regression	5.697414	Akaike info criterion		6.439981
Sum squared resid	1071.197	Schwarz criterion		6.655453
Log likelihood	-117.3596	Hannan-Quinn criter.		6.516644
F-statistic	7.044033	Durbin-Watson stat		2.127815
Prob(F-statistic)	0.000325			

Source: Author's Computation Using E-views 9.0.

DISCUSSION AND FINDINGS

From the above table 4.4b, it can be seen that the level of agricultural development is positively related to the dependent variable economic growth in the long run. This implies that one percent increase in agricultural development in Nigeria will result in 20.14 percent increase in current level of economic growth. The results above show that agricultural development is a statistically significant factor affecting current level economic growth in Nigeria at 5% level of significance.

From the above table 4.4b, it can be seen that the level of capital formation is negatively related to the dependent variable economic growth in the long run. This implies that one percent increase in capital formation in Nigeria will result in 0.54 percent decrease in current level of economic growth. The results above show that capital formation is a statistically significant factor affecting current level economic growth in Nigeria at 5% level of significance.

From the above table 4.4b, it can be seen that the level of Inflation is positively related to the dependent variable economic growth in the long run. This implies that one percent increase in Inflation in Nigeria will result in 1.02 percent increase in current level of economic growth. The results above show that Inflation is a statistically insignificant factor affecting current level economic growth in Nigeria at 5% level of significance.

From the above table 4.4b, it can be seen that the level of real interest rate is positively related to the dependent variable economic growth in the long run. This

implies that one percent increase in real interest rate in Nigeria will result in 0.18 percent increase in current level of economic growth. The results above show that real interest rate is a statistically insignificant factor affecting current level economic growth in Nigeria at 5% level of significance.

The coefficient of determination (R^2) showed that, about 50% of the systematic variations in the explained variable are accounted for by the joint influence of all the explanatory variables employed in the study, while the remaining 50% is due to other factors captured by the error term. This further confirms that the model is correctly specified.

The F-statistics indicate a rejection of the null hypothesis of joint insignificance (at 5% significance level). In other words, we are about 95% confident that the explanatory variables are simultaneously significant when addressing the various factors that influence economic growth in Nigeria.

The Durbin Watson statistic which is approximately equals 2 indicating that autocorrelation is absent in the estimated model, this makes the estimated model reliable and fit for policy perspective.

From the below table 4.6a, it can be seen that the level of agricultural development is positively related to the dependent variable labour participation rate in the short run. This implies that one percent increase in agricultural development in Nigeria will result in 0.05 percent increase in current level of labour participation rate. The results

below show that agricultural development is a statistically significant factor affecting current level labour participation rate in Nigeria at 5% level of significance.

From the below table 4.6a, it can be seen that the level of capital formation is negatively related to the dependent variable labour participation rate in the short run. This implies that one percent increase in capital formation in Nigeria will result in 0.06 percent increase in current level of labour participation rate. The results below show that capital formation is a statistically significant factor affecting current level labour participation rate in Nigeria at 5% level of significance.

From the below table 4.6a, it can be seen that the level of Inflation is positively related to the dependent variable labour participation rate in the short run. This implies that one percent increase in Inflation in Nigeria will result in 0.001 percent increase in current level of labour participation rate. The results below show that Inflation is a statistically insignificant factor affecting current level labour participation rate in Nigeria at 5% level of significance.

From the below table 4.6a, it can be seen that the level of real interest rate is positively related to the dependent variable labour participation rate in the short run. This implies that one percent increase in real interest rate in Nigeria will result in 0.01 percent increase in current level of labour participation rate. The results below show that real interest rate is a statistically insignificant factor affecting current level labour participation rate in Nigeria at 5% level of significance.

The coefficient of determination (R^2) showed that, about 68% of the systematic variations in the explained variable are accounted for by the joint influence of all the explanatory variables employed in the study, while the remaining 32% is due to other factors captured by the error term. This further confirms that the model is correctly specified. The F-statistics indicate a rejection of the null hypothesis of joint insignificance (at 5% significance level). In other words, we are about 95% confident that the explanatory variables are simultaneously significant when addressing the various factors that influence economic growth in Nigeria. The Durbin Watson statistic which is approximately equals 2 indicating that autocorrelation is absent in the estimated model, this makes the estimated model reliable and fit for policy perspective.

From the below table 4.6b, it can be seen that the level of agricultural development is positively related to the dependent variable labour participation rate in the long run. This implies that one percent increase in agricultural development in Nigeria will result in 0.05 percent increase in current level of labour participation rate. The results below show that agricultural development is a statistically significant factor affecting current level of labour participation rate in Nigeria at 5% level of significance.

From the below table 4.6b, it can be seen that the level of capital formation is positively related to the dependent variable labour participation rate in the long run. This implies that one percent increase in capital formation in Nigeria will result in 0.08 percent increase in current level of labour participation rate. The results below show that

capital formation is a statistically significant factor affecting current level of labour participation rate in Nigeria at 5% level of significance.

From the below table 4.6b, it can be seen that the level of Inflation is positively related to the dependent variable labour participation rate in the long run. This implies that one percent increase in Inflation in Nigeria will result in 0.004 percent increase in current level of labour participation rate. The results below show that Inflation is a statistically insignificant factor affecting current level of labour participation rate in Nigeria at 5% level of significance.

From the below table 4.6b, it can be seen that the level of real interest rate is positively related to the dependent variable labour participation rate in the long run. This implies that one percent increase in real interest rate in Nigeria will result in 0.01 percent increase in current level of labour participation rate. The results below show that real interest rate is a statistically significant factor affecting current level of labour participation rate in Nigeria at 5% level of significance.

The coefficient of determination (R^2) showed that, about 59% of the systematic variations in the explained variable are accounted for by the joint influence of all the explanatory variables employed in the study, while the remaining 41% is due to other factors captured by the error term. This further confirms that the model is correctly specified.

The F-statistics indicate a rejection of the null hypothesis of joint insignificance (at 5% significance level). In other words, we are about 95% confident that the explanatory

variables are simultaneously significant when addressing the various factors that influence economic growth in Nigeria.

The Durbin Watson statistic which is approximately equals 2 indicating that autocorrelation is absent in the estimated model, this makes the estimated model reliable and fit for policy perspective.

4.4a DIAGNOSTIC TESTS

The table 4.5a below indicates that the in the Short Run Model, there is absence of serial correlation, heteroscedasticity and multicollinearity.

Table 4.5: Test on the Error Term

TEST	**TYPE**	Decision condition	**CONCLUSION**
Multicollinearity test	Variance Inflation factor	Less than 10	No multicollinearity
Serial correlation	Breusch-Godfrey Serial Correlation LM Test	0.2824 greater than 0.05 sig. level	No serial correlation
Heteroskedasticity	Breusch-Pagan Test	0.1403 greater than 0.05 sig. level	Homoskedastic (equal spread)

Source: Author's compilation Using E-views 9.0.

4.4b DIAGNOSTIC TESTS

The table 4.5b below indicates that the in the model, there is absence of serial correlation, heteroscedasticity and multicollinearity.

Table 4.7: Test on the Error Term Table 4.5: Test on the Error Term

TEST	**TYPE**	Decision condition	**CONCLUSION**
Multicollinearity test	Variance Inflation factor	Less than 10	No multicollinearity
Serial correlation	Breusch-Godfrey Serial Correlation LM Test	0.7189 greater than 0.05 sig. level.	No serial correlation
Heteroskedasticity	Breusch-Pagan Test	0.1403 greater than 0.05 sig. level.	Homoskedastic (equal spread)

Source: Author's compilation Using E-views 9.0.

4.5 POLICY IMPLICATIONS

Agricultural development was found to have a negative impact on economic growth and this conforms to theory. This can conformity can be due to some economic reasons. Agricultural development leads to an increase in incomes of farmers and therefore their purchasing power. Agriculture can therefore contributes to economic growth by increasing the incomes of majority of the population thereby strengthening their saving capacity. Also, agricultural development can bring about increase in economic output and this eventually results to a growth to the economy.

Gross fixed capital formation which was found to have a negative impact on Gross Domestic Product and this does not conform to theory and this can be due to some reasons. Based on theory, increasing gross fixed capital formation is supposed to bring

about increasing GDP but the case is reverse from this study. This can be due to the fact that fixed capital accumulated over time are sometimes kept idle and so they are underutilized hence leading to a drop in economic output/growth in Nigerian economy at large.

Inflation was also found to have a positive effect on economic theory and this does not conforms to theory and this can be due to some reasons. Inflation tends to increase the aggregate money income (i.e., national income) of the country as a whole on account of larger spending and greater production. Similarly, the volume of employment increases under the impact of increased production thereby leading to increase in GDP level which is an indicator of economic growth.

Also, we see that exchange rate has a positive relationship with gross domestic product. In foreign exchange, increase in exchange rate is simply known as appreciation and the findings of this study clearly shows that appreciation of a country's currency against others can increase its country's growth. Appreciation is directly linked to demand. If the value appreciates (or goes up), demand for the currency also rise. This can provide additional demand which increases economic growth. Therefore, the exchange rate should be seriously monitored and revitalized as there is a lot that can be benefited from it.

For hypothesis two: Agricultural development does not have a significant impact on employment creation in Nigeria.

Agricultural development was found to have a negative impact on labour participation rate and this conforms to theory. This can conformity can be due to some economic reasons. But most new and good jobs are to be generated down and up agricultural stream. With the demand for aggregation, storage, processing, logistics, food preparation, restaurants and other related services becoming increasingly important, many employment opportunities will emerge off the farm, in the larger agri-food systems. Just like Hello Tractor generates high-quality job opportunities for tractor owners, drivers and other providers of financial services, these downstream activities will also open up significant job opportunities. While some youths in Nigeria expresses to see its future outside agriculture, many good job opportunities on and off the farm remain in agriculture. The challenge is to make the agricultural sector and its up and downstream activities competitive through innovation, public investment in supportive rural public goods and services, and secondary town development to make them sufficiently attractive to young and older farmers alike. This remains a largely unfinished agenda, one which is equally important to reach the twin goals of eradicating extreme poverty and boosting shared prosperity

Capital formation which was found to have a positive impact on labour participation rate and this conform to theory and this can be due to some reasons. Based on theory, increasing capital formation increases domestic investment and the increase of

investment will affect economic growth, which then will create employment and economic welfare to increase through the increase of productivity and wage rate.

Inflation was also found to have a positive effect on labour participation rate and this does not conforms to theory and this can be due to some reasons. For instance, if the economy is at its natural potential output, then increasing inflation by increasing the money supply will raise economic output and employment temporarily, by increasing aggregate demand, but as prices adjust to the new level of money supply, economic output and employment will return to its natural state

Short run estimates

The table below shows the OLS regression results regressing LPR on the independent variables AGD, CPA, INF, RIR. The table also shows the significant or non-significant level of impact these independent variables on ECGT.

Table 4.6a: Ordinary Least Squares estimates

Dependent variable: LPR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGD	0.050026	0.029717	2.337389	0.0380
CPA	-0.059485	0.016714	3.558893	0.0012
INF	0.001412	0.005448	-0.259181	0.7972
RIR	0.011215	0.005054	2.218885	0.0337
C	1.615942	0.546228	2.958368	0.0058

R-squared	0.681224	Mean dependent var	4.156410
Adjusted R-squared	0.631415	S.D. dependent var	0.035939
S.E. of regression	0.021819	Akaike info criterion	-4.668107
Sum squared resid	0.015235	Schwarz criterion	-4.409541
Log likelihood	94.69404	Hannan-Quinn criter.	-4.576112
F-statistic	13.67680	Durbin-Watson stat	1.504032
Prob(F-statistic)	0.000000		

Source: Author's Computation Using E-views 9.0.

Table 4.6b: Long run model

Dependent variable: LPR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.661040	0.083402	43.89633	0.0000
AGD(-1)	0.049978	0.026612	1.878053	0.0092
CPA(-1)	0.084057	0.019144	4.390790	0.0001
INF(-1)	0.003809	0.006048	0.629771	0.5332
RIR(-1)	0.011762	0.005988	1.964413	0.0579
R-squared	0.587690	Mean dependent var		4.156363

Adjusted R-squared	0.537713	S.D. dependent var	0.035951
S.E. of regression	0.024444	Akaike info criterion	-4.462791
Sum squared resid	0.019718	Schwarz criterion	-4.247319
Log likelihood	89.79303	Hannan-Quinn criter.	-4.386128
F-statistic	11.75923	Durbin-Watson stat	1.504803
Prob(F-statistic)	0.000005		

Source: Author's Computation Using E-views 9.0.

CHAPTER FIVE

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1 SUMMARY OF FINDINGS

This study examined the contribution of agriculture to economic growth in Nigeria over the period of 1980 to 2019.The study employed Ordinary Least Square (OLS) method of estimation. The following findings were made:

1. A negative relationship exist between decine in agricultural production and economic growth

2. A negative relationship exist between the impact of agricultural sector and economic growth

3. A positive relationship exist between the effect of agricultural sector on employment creation and economic growth

5.2 RECOMMENDATIONS

Sequel to the findings and careful Investigation of the contribution of agriculture to economic growth in Nigeria, it is therefore pertinent to make the following policy implications to government and its agencies:

1. Government should ensure that fixed capital accumulated over time from production and exportation of agricultural produce should be fully maximized

2. There should be an increase in the incomes of majority of the population thereby strengthening their saving capacity

3. Government should foster public investment in supportive rural public goods and services and secondary town development to make them sufficiently attractive to young

and older farmers.Thereby,providing job opportunities through improvement of the agricultural sector

5.3 CONCLUSION

In conclusion, agricultural development in Nigeria has not positively impacted economic growth over the period under study.

Adequate attention need to be given to the agricultural sector in order to ensure that incomes from production and exportation of agricultural produce are fully maximized for speedy agricultural development in Nigeria.

APPENDIX ONE

UNIT ROOT
AT LEVEL
ECGT

Null Hypothesis: ECGT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.720404	0.0005
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ECGT)
Method: Least Squares
Date: 06/09/21 Time: 22:38
Sample (adjusted): 1981 2019
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECGT(-1)	-0.752776	0.159473	-4.720404	0.0000
C	2.608111	1.276157	2.043723	0.0481

R-squared	0.375867	Mean dependent var	-0.072848
Adjusted R-squared	0.358998	S.D. dependent var	8.914060
S.E. of regression	7.136826	Akaike info criterion	6.818334
Sum squared resid	1884.569	Schwarz criterion	6.903645
Log likelihood	-130.9575	Hannan-Quinn criter.	6.848943
F-statistic	22.28222	Durbin-Watson stat	1.870452
Prob(F-statistic)	0.000033		

LPR

Null Hypothesis: LPR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.042000	0.2685
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LPR)
Method: Least Squares
Date: 06/09/21 Time: 22:25
Sample (adjusted): 1981 2019
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LPR(-1)	-0.236656	0.115894	-2.042000	0.0483
C	0.984961	0.481482	2.045686	0.0479

R-squared	0.101282	Mean dependent var	0.001807
Adjusted R-squared	0.076993	S.D. dependent var	0.025405
S.E. of regression	0.024407	Akaike info criterion	-4.537975
Sum squared resid	0.022041	Schwarz criterion	-4.452664
Log likelihood	90.49051	Hannan-Quinn criter.	-4.507366
F-statistic	4.169765	Durbin-Watson stat	1.165318
Prob(F-statistic)	0.048328		

AGD

Null Hypothesis: AGD has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.155963	0.0305
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(AGD)
Method: Least Squares
Date: 06/09/21 Time: 22:40
Sample (adjusted): 1981 2019
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGD(-1)	-0.209932	0.066519	-3.155963	0.0032
C	0.665797	0.206146	3.229741	0.0026

R-squared	0.212097	Mean dependent var	0.017097
Adjusted R-squared	0.190802	S.D. dependent var	0.108950
S.E. of regression	0.098006	Akaike info criterion	-1.757647
Sum squared resid	0.355394	Schwarz criterion	-1.672336
Log likelihood	36.27412	Hannan-Quinn criter.	-1.727039
F-statistic	9.960104	Durbin-Watson stat	1.675863
Prob(F-statistic)	0.003175		

CPA

Null Hypothesis: CPA has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.655636	0.4453
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CPA)
Method: Least Squares
Date: 06/09/21 Time: 22:41
Sample (adjusted): 1981 2019
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPA(-1)	-0.060633	0.036622	-1.655636	0.1063
C	0.181473	0.128800	1.408945	0.1672

R-squared	0.068975	Mean dependent var	-0.029204
Adjusted R-squared	0.043812	S.D. dependent var	0.127326
S.E. of regression	0.124506	Akaike info criterion	-1.279013
Sum squared resid	0.573560	Schwarz criterion	-1.193702
Log likelihood	26.94075	Hannan-Quinn criter.	-1.248404
F-statistic	2.741131	Durbin-Watson stat	1.540150
Prob(F-statistic)	0.106254		

INF

Null Hypothesis: INF has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.501136	0.0132
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 06/09/21 Time: 22:42
Sample (adjusted): 1981 2019
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.494632	0.141277	-3.501136	0.0012
C	1.328690	0.390233	3.404860	0.0016

R-squared	0.248852	Mean dependent var	0.005155
Adjusted R-squared	0.228551	S.D. dependent var	0.688446
S.E. of regression	0.604677	Akaike info criterion	1.881675
Sum squared resid	13.52846	Schwarz criterion	1.966986
Log likelihood	-34.69266	Hannan-Quinn criter.	1.912284
F-statistic	12.25795	Durbin-Watson stat	1.678616
Prob(F-statistic)	0.001227		

RIR

Null Hypothesis: RIR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.315806	0.1725
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RIR)
Method: Least Squares
Date: 06/09/21 Time: 22:42
Sample (adjusted): 1983 2019
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RIR(-1)	-0.057034	0.024628	-2.315806	0.0266
C	0.366134	0.098193	3.728726	0.0007

R-squared	0.132868	Mean dependent var	0.165200
Adjusted R-squared	0.108093	S.D. dependent var	0.296099
S.E. of regression	0.279639	Akaike info criterion	0.341901
Sum squared resid	2.736921	Schwarz criterion	0.428978
Log likelihood	-4.325169	Hannan-Quinn criter.	0.372600
F-statistic	5.362958	Durbin-Watson stat	1.909249
Prob(F-statistic)	0.026550		

AT FIRST DIFFERENCE

ECGT

Null Hypothesis: D(ECGT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.972241	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ECGT,2)
Method: Least Squares
Date: 06/09/21 Time: 22:48
Sample (adjusted): 1982 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ECGT(-1))	-1.415921	0.141986	-9.972241	0.0000
C	0.356460	1.265653	0.281641	0.7798

R-squared	0.734211	Mean dependent var	0.441686
Adjusted R-squared	0.726828	S.D. dependent var	14.92719
S.E. of regression	7.801832	Akaike info criterion	6.997790
Sum squared resid	2191.269	Schwarz criterion	7.083979
Log likelihood	-130.9580	Hannan-Quinn criter.	7.028455
F-statistic	99.44558	Durbin-Watson stat	2.226748
Prob(F-statistic)	0.000000		

LPR

Null Hypothesis: D(LPR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.939748	0.0013
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LPR,2)
Method: Least Squares
Date: 06/09/21 Time: 22:49
Sample (adjusted): 1982 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LPR(-1))	-0.722076	0.372253	-1.939748	0.0603
C	0.002324	0.004257	0.546020	0.5884

R-squared	0.094627	Mean dependent var	0.003651
Adjusted R-squared	0.069478	S.D. dependent var	0.026850
S.E. of regression	0.025901	Akaike info criterion	-4.417882
Sum squared resid	0.024151	Schwarz criterion	-4.331693
Log likelihood	85.93975	Hannan-Quinn criter.	-4.387216
F-statistic	3.762624	Durbin-Watson stat	1.198547
Prob(F-statistic)	0.060276		

AGD

Null Hypothesis: D(AGD) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.997423	0.0002
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(AGD,2)
Method: Least Squares
Date: 06/09/21 Time: 22:54
Sample (adjusted): 1982 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(AGD(-1))	-0.814207	0.162925	-4.997423	0.0000
C	0.012216	0.017953	0.680439	0.5006

R-squared	0.409587	Mean dependent var	-0.001372
Adjusted R-squared	0.393186	S.D. dependent var	0.140430
S.E. of regression	0.109393	Akaike info criterion	-1.536546
Sum squared resid	0.430805	Schwarz criterion	-1.450358
Log likelihood	31.19438	Hannan-Quinn criter.	-1.505881
F-statistic	24.97424	Durbin-Watson stat	1.839737
Prob(F-statistic)	0.000015		

CPA
Null Hypothesis: D(CPA) has a unit root

Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.689477	0.0005
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CPA,2)
Method: Least Squares
Date: 06/09/21 Time: 22:55
Sample (adjusted): 1982 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CPA(-1))	-0.831638	0.177341	-4.689477	0.0000
C	-0.026764	0.021629	-1.237406	0.2239

R-squared	0.379216	Mean dependent var	0.004509
Adjusted R-squared	0.361972	S.D. dependent var	0.158786
S.E. of regression	0.126833	Akaike info criterion	-1.240692
Sum squared resid	0.579120	Schwarz criterion	-1.154503
Log likelihood	25.57314	Hannan-Quinn criter.	-1.210026
F-statistic	21.99119	Durbin-Watson stat	1.791282
Prob(F-statistic)	0.000039		

INF
Null Hypothesis: D(INF) has a unit root
Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.310399	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF,2)
Method: Least Squares
Date: 06/09/21 Time: 22:56
Sample (adjusted): 1982 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-1.034957	0.164008	-6.310399	0.0000
C	-0.013897	0.112914	-0.123074	0.9027

R-squared	0.525198	Mean dependent var	-0.019148
Adjusted R-squared	0.512009	S.D. dependent var	0.996371
S.E. of regression	0.696028	Akaike info criterion	2.164344
Sum squared resid	17.44040	Schwarz criterion	2.250532
Log likelihood	-39.12253	Hannan-Quinn criter.	2.195009
F-statistic	39.82113	Durbin-Watson stat	1.894835
Prob(F-statistic)	0.000000		

RIR
Null Hypothesis: D(RIR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.153929	0.0002
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RIR,2)
Method: Least Squares
Date: 06/09/21 Time: 22:57
Sample (adjusted): 1984 2019
Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RIR(-1))	-0.880650	0.170870	-5.153929	0.0000
C	0.147477	0.058127	2.537170	0.0159

R-squared	0.438601	Mean dependent var	-0.002213
Adjusted R-squared	0.422089	S.D. dependent var	0.397395
S.E. of regression	0.302101	Akaike info criterion	0.497843
Sum squared resid	3.103015	Schwarz criterion	0.585817
Log likelihood	-6.961181	Hannan-Quinn criter.	0.528548
F-statistic	26.56298	Durbin-Watson stat	1.992588
Prob(F-statistic)	0.000011		

MODEL ONE
CO-INTERGRATION

Date: 06/09/21 Time: 23:15
Sample (adjusted): 1984 2019
Included observations: 36 after adjustments

Trend assumption: Linear deterministic trend
Series: ECGT AGD CPA INF RIR
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.763323	106.9346	69.81889	0.0000
At most 1 *	0.502021	55.05647	47.85613	0.0091
At most 2 *	0.360476	29.95739	29.79707	0.0479
At most 3	0.261293	13.86425	15.49471	0.0867
At most 4	0.078972	2.961532	3.841466	0.0853

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.763323	51.87815	33.87687	0.0001
At most 1	0.502021	25.09909	27.58434	0.1007
At most 2	0.360476	16.09313	21.13162	0.2194
At most 3	0.261293	10.90272	14.26460	0.1591
At most 4	0.078972	2.961532	3.841466	0.0853

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

ECGT	AGD	CPA	INF	RIR
0.186240	-3.405411	-0.930726	1.261073	0.151488
0.095570	-8.618959	4.092783	-0.561101	1.180092
0.187062	2.501085	-1.854404	-0.689487	-1.069511
0.032461	0.304232	0.036387	-1.085563	0.353563

0.019720	2.052407	3.477296	-0.071642	0.753068

Unrestricted Adjustment Coefficients (alpha):

D(ECGT)	-2.530185	-2.896091	-2.517247	-0.178972	0.672796
D(AGD)	-0.013988	0.059104	-0.021079	-0.017987	-0.006971
D(CPA)	0.028930	-0.029582	-0.006150	0.008152	-0.030592
D(INF)	-0.241815	0.161077	0.007695	0.263663	-0.005722
D(RIR)	-0.139527	-0.007809	0.131065	-0.026076	-0.026120

1 Cointegrating Equation(s):	Log likelihood	-74.84886

Normalized cointegrating coefficients (standard error in parentheses)

ECGT	AGD	CPA	INF	RIR
1.000000	-18.28509	-4.997459	6.771231	0.813401
	(5.13195)	(3.19447)	(1.04771)	(0.99909)

Adjustment coefficients (standard error in parentheses)

D(ECGT)	-0.471221
	(0.22446)
D(AGD)	-0.002605
	(0.00348)
D(CPA)	0.005388
	(0.00412)
D(INF)	-0.045036
	(0.02006)
D(RIR)	-0.025985
	(0.00882)

2 Cointegrating Equation(s):	Log likelihood	-62.29932

Normalized cointegrating coefficients (standard error in parentheses)

ECGT	AGD	CPA	INF	RIR
1.000000	0.000000	-17.15939	9.986363	-2.119994

		(4.03289)	(1.60343)	(1.05368)
0.000000	1.000000	-0.665128	0.175834	-0.160426
		(0.13242)	(0.05265)	(0.03460)

Adjustment coefficients (standard error in parentheses)

D(ECGT)	-0.748002	33.57761	
	(0.22578)	(9.99566)	
D(AGD)	0.003044	-0.461785	
	(0.00316)	(0.13993)	
D(CPA)	0.002561	0.156449	
	(0.00449)	(0.19874)	
D(INF)	-0.029641	-0.564837	
	(0.02166)	(0.95893)	
D(RIR)	-0.026732	0.542451	
	(0.00991)	(0.43872)	

3 Cointegrating Equation(s):	Log likelihood	-54.25275

Normalized cointegrating coefficients (standard error in parentheses)

ECGT	AGD	CPA	INF	RIR
1.000000	0.000000	0.000000	-7.049809	-3.664288
			(2.60900)	(0.94623)
0.000000	1.000000	0.000000	-0.484519	-0.220285
			(0.10731)	(0.03892)
0.000000	0.000000	1.000000	-0.992819	-0.089997
			(0.19359)	(0.07021)

Adjustment coefficients (standard error in parentheses)

D(ECGT)	-1.218884	27.28176	-4.830170
	(0.27288)	(9.33049)	(4.46037)
D(AGD)	-0.000899	-0.514505	0.294008
	(0.00409)	(0.13999)	(0.06692)
D(CPA)	0.001410	0.141068	-0.136595
	(0.00601)	(0.20556)	(0.09827)
D(INF)	-0.028202	-0.545591	0.870046
	(0.02905)	(0.99314)	(0.47476)
D(RIR)	-0.002214	0.870257	-0.145147

	(0.01140)	(0.38976)	(0.18632)

4 Cointegrating Equation(s):	Log likelihood	-48.80139

Normalized cointegrating coefficients (standard error in parentheses)

ECGT	AGD	CPA	INF	RIR
1.000000	0.000000	0.000000	0.000000	-9.348670
				(2.44298)
0.000000	1.000000	0.000000	0.000000	-0.610961
				(0.15509)
0.000000	0.000000	1.000000	0.000000	-0.890524
				(0.31329)
0.000000	0.000000	0.000000	1.000000	-0.806317
				(0.29470)

Adjustment coefficients (standard error in parentheses)

D(ECGT)	-1.224693	27.22731	-4.836682	0.364146
	(0.27454)	(9.32972)	(4.45790)	(1.83270)
D(AGD)	-0.001483	-0.519977	0.293354	-0.016743
	(0.00401)	(0.13633)	(0.06514)	(0.02678)
D(CPA)	0.001675	0.143548	-0.136298	0.048472
	(0.00604)	(0.20515)	(0.09802)	(0.04030)
D(INF)	-0.019643	-0.465376	0.879640	-0.686855
	(0.02576)	(0.87535)	(0.41826)	(0.17195)
D(RIR)	-0.003061	0.862324	-0.146095	-0.233633
	(0.01139)	(0.38718)	(0.18500)	(0.07606)

MODEL ESTIMATES

SHORT RUN EQUATION

Dependent Variable: ECGT
Method: Least Squares
Date: 06/25/21 Time: 17:42
Sample (adjusted): 1983 2019

Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECGT(-1)	-0.074860	0.148844	-0.502940	0.6188
AGD	-14.58965	9.757780	-1.495181	0.1457
AGD(-1)	34.82884	9.420972	3.696948	0.0009
CPA	-2.045760	4.551108	-0.449508	0.6564
INF	-0.116459	1.409417	-0.082629	0.9347
RIR	-8.563105	3.345514	-2.559578	0.0160
RIR(-1)	7.694115	3.376331	2.278839	0.0302
C	-46.95257	20.11449	-2.334266	0.0267

R-squared	0.709284	Mean dependent var	4.060429
Adjusted R-squared	0.390835	S.D. dependent var	6.868094
S.E. of regression	5.360480	Akaike info criterion	6.384794
Sum squared resid	833.3076	Schwarz criterion	6.733101
Log likelihood	-110.1187	Hannan-Quinn criter.	6.507589
F-statistic	4.299615	Durbin-Watson stat	2.251542
Prob(F-statistic)	0.002275		

LONG RUN EQUATION

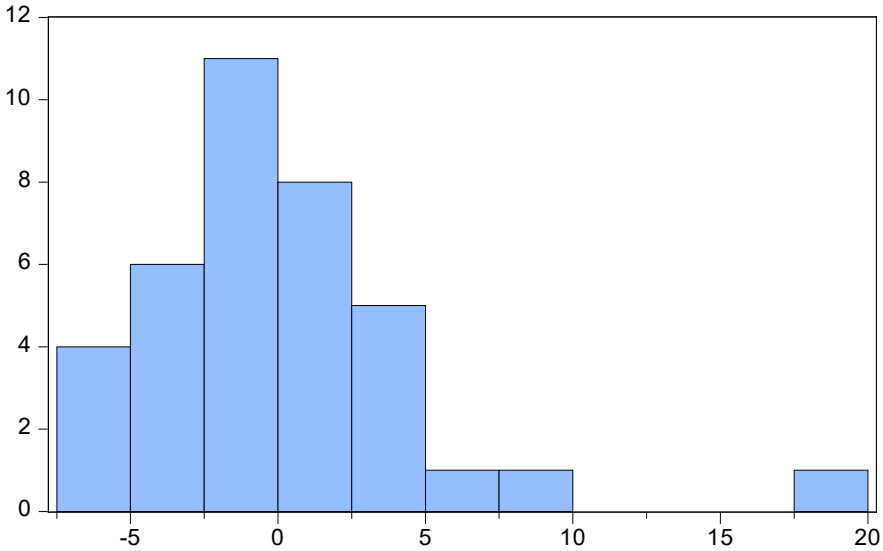
Dependent Variable: ECGT
Method: Least Squares
Date: 06/09/21 Time: 23:47
Sample (adjusted): 1981 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-60.37704	19.43941	-3.105908	0.0039
AGD(-1)	20.13500	6.202702	3.246166	0.0027
CPA(-1)	-0.543370	4.462065	-4.121775	0.0038
INF(-1)	1.016700	1.409571	0.721283	0.4758
RIR(-1)	0.181433	1.395634	0.130001	0.8974

R-squared	0.500574	Mean dependent var	3.608105

Adjusted R-squared	0.395189	S.D. dependent var	7.326017
S.E. of regression	5.697414	Akaike info criterion	6.439981
Sum squared resid	1071.197	Schwarz criterion	6.655453
Log likelihood	-117.3596	Hannan-Quinn criter.	6.516644
F-statistic	7.044033	Durbin-Watson stat	2.127815
Prob(F-statistic)	0.000325		

DIAGNOSTICS



Series: Residuals
Sample 1983 2019
Observations 37

Mean	1.73e-14
Median	-0.459256
Maximum	18.48115
Minimum	-7.234581
Std. Dev.	4.811178
Skewness	1.550977
Kurtosis	7.191307
Jarque-Bera	41.91666
Probability	0.000000

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.201287	Prob. F(1,28)	0.2824
Obs*R-squared	1.522111	Prob. Chi-Square(1)	0.2173

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.201287	Prob. F(1,28)	0.2824

Obs*R-squared	1.522111	Prob. Chi-Square(1)	0.2173

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.312110	Prob. F(7,29)	0.2800
Obs*R-squared	8.899793	Prob. Chi-Square(7)	0.2599
Scaled explained SS	16.92485	Prob. Chi-Square(7)	0.0179

Variance Inflation Factors
Date: 06/25/21 Time: 17:53
Sample: 1980 2019
Included observations: 37

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
ECGT(-1)	0.022155	1.779020	1.323733
AGD	95.21426	1210.054	3.512845
AGD(-1)	88.75471	1119.457	4.128511
CPA	20.71259	312.6257	6.158828
INF	1.986457	19.71195	1.221539
RIR	11.19246	241.7666	5.71822
RIR(-1)	11.39961	233.3364	5.14636
C	404.5928	520.9698	NA

MODEL TWO

Dependent Variable: LPR
Method: Least Squares
Date: 06/25/21 Time: 18:18
Sample (adjusted): 1982 2019

Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LPR(-1)	0.546253	0.144184	3.788569	0.0006
AGD	0.050026	0.029717	2.337389	0.0380
CPA	0.059485	0.016714	3.558893	0.0012
INF	-0.001412	0.005448	-0.259181	0.7972
RIR	0.011215	0.005054	2.218885	0.0337
C	1.615942	0.546228	2.958368	0.0058

		Mean dependent	
R-squared	0.681224	var	4.156410
Adjusted R-squared	0.631415	S.D. dependent var	0.035939
S.E. of regression	0.021819	Akaike info criterion	-4.668107
Sum squared resid	0.015235	Schwarz criterion	-4.409541
		Hannan-Quinn	
Log likelihood	94.69404	criter.	-4.576112
F-statistic	13.67680	Durbin-Watson stat	1.504032
Prob(F-statistic)	0.000000		

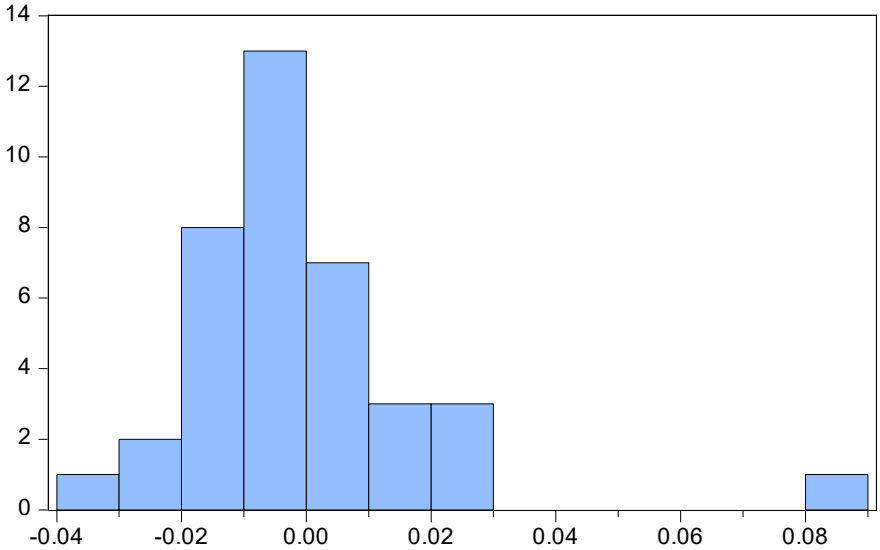
LONG RUN EQUATION
Dependent Variable: LPR
Method: Least Squares
Date: 06/10/21 Time: 00:01
Sample (adjusted): 1981 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.661040	0.083402	43.89633	0.0000
AGD(-1)	0.049978	0.026612	2.878053	0.0092
CPA(-1)	0.084057	0.019144	4.390790	0.0001
INF(-1)	0.003809	0.006048	0.629771	0.5332
RIR(-1)	0.011762	0.005988	2.964413	0.0579

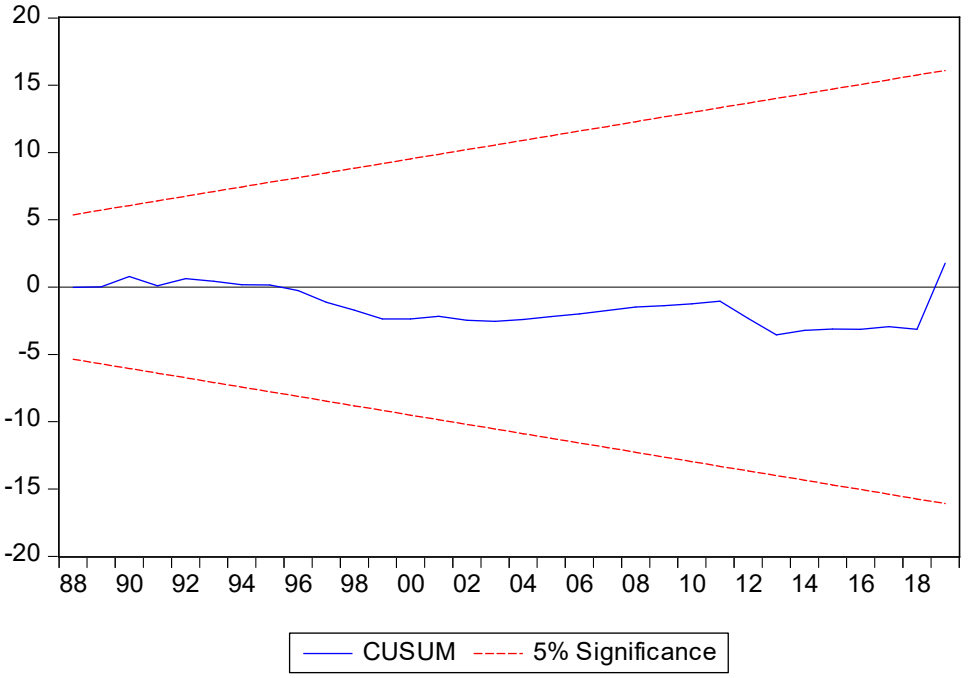
		Mean dependent	
R-squared	0.587690	var	4.156363

Adjusted R-squared	0.537713	S.D. dependent var	0.035951
S.E. of regression	0.024444	Akaike info criterion	-4.462791
Sum squared resid	0.019718	Schwarz criterion	-4.247319
		Hannan-Quinn criter.	
Log likelihood	89.79303		-4.386128
F-statistic	11.75923	Durbin-Watson stat	1.504803
Prob(F-statistic)	0.000005		

DIAGNOSTICS



Series: Residuals	
Sample 1982 2019	
Observations 38	
Mean	-1.58e-16
Median	-0.002970
Maximum	0.089500
Minimum	-0.034910
Std. Dev.	0.020292
Skewness	2.280526
Kurtosis	11.17565
Jarque-Bera	138.7704
Probability	0.000000



Variance Inflation Factors
Date: 06/25/21 Time: 18:36
Sample: 1980 2019
Included observations: 38

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LPR(-1)	0.020789	28643.58	1.932839
AGD	0.000883	689.9687	2.481894
CPA	0.000279	266.1444	5.660480
INF	2.97E-05	18.03353	1.126875
RIR	2.55E-05	33.31592	7.169772
C	0.298365	23815.01	NA

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.131894	Prob. F(1,31)	0.7189
Obs*R-squared	0.160991	Prob. Chi-Square(1)	0.6882

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	3.628502	Prob. F(5,32)	0.1403
Obs*R-squared	13.74912	Prob. Chi-Square(5)	0.0673
Scaled explained SS	49.60665	Prob. Chi-Square(5)	0.5560

APPENDIX TWO

DATA

YEAR	ECGT	LPR	AGD	INF	RIR	CPA
1980	4.21000009	63.123	11.24578	9.97	0.53	79.38613
1981	-13.12788049	63.221	12.24041	20.81	0.618	89.38613
1982	-1.05318606	63.334	13.50269	7.7	0.673	85.9414
1983	-5.050451109	63.448	14.99073	23.21	0.724	75.75651
1984	-2.021537569	63.562	18.30836	17.82	0.767	58.95629
1985	8.3228297	63.676	18.22764	7.44	0.894	46.39545
1986	-8.754176979	63.719	18.02043	5.72	1.755	54.94827
1987	-10.75170014	63.904	20.55211	11.29	4.016	50.04989
1988	7.542522025	64.018	23.37165	54.51	4.537	43.75477
1989	6.467191144	64.132	21.2756	50.47	7.365	52.48744
1990	12.76600917	66.985	21.55626	7.36	8.038	53.12219
1991	0.6178506	66.843	20.88528	13.01	9.91	48.40018
1992	0.4337254	66.511	20.32116	44.59	17.3	43.77439
1993	2.0903778	66.287	23.49113	57.17	22.07	44.47636
1994	0.9097633	66.017	25.17385	57.03	22	42.06784
1995	0.307469	65.682	25.48651	72.84	21.9	37.20593
1996	4.9937055	65.443	26.19916	29.27	21.88	36.58167
1997	2.8022564	65.198	27.41665	8.53	21.89	38.42226
1998	2.7156402	64.95	27.90837	10	21.89	40.5534
1999	0.4742376	64.773	26.02849	6.62	92.84	38.278
2000	5.3180934	64.527	21.35724	6.93	101.7	34.04928
2001	4.4110652	64.508	24.47535	18.87	111.2	30.03794
2002	3.7846482	64.265	36.96508	12.88	120.6	26.76866
2003	10.354185	64.216	33.82706	14.03	129.2	28.3709
2004	33.735775	64.128	27.23045	15	132.9	26.06325
2005	3.4446668	64.122	26.08928	17.86	131.3	24.96612
2006	8.2109649	64.294	24.73499	8.23	128.7	26.1665
2007	6.8283983	64.413	24.66258	5.39	125.8	20.18004
2008	6.2702637	64.494	25.27975	11.58	118.6	18.85977

2009	6.934416	64.513	26.74885	12.56	148.9	21.11545
2010	7.8397395	64.502	23.8937	13.72	150.3	16.81501
2011	4.8873866	64.619	22.23471	10.84	153.9	15.67631
2012	4.2792773	62.327	21.85996	12.22	157.5	14.21112
2013	5.3944163	59.985	20.75862	8.48	157.3	14.16873
2014	6.3097183	59.825	19.99025	8.06	158.6	15.08353
2015	2.6526936	59.541	20.63189	9.01	192.4	14.82718
2016	1.616869	59.103	20.98311	15.68	253.5	14.72496
2017	0.8058866	59.039	20.84657	16.52	305.8	14.71562
2018	1.9227573	58.866	21.20377	12.09	306.1	19.01838
2019	1.3689291	67.732	21.9063	12.19	304	25.41589

Source: I. World Development indicators (2019)
II. CBN Statistical bulletin (2019)