Global Scientific JOURNALS

GSJ: Volume 10, Issue 10, October 2022, Online: ISSN 2320-9186
www.globalscientificjournal.com

THE IMPACT OF SELECTED MACROECONOMIC AGGREGATES ON ECONOMIC GROWTH OF NIGERIA: 1981-2020

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APRIL 2022

ABSTRACT

This study examined the impact of macro-economic aggregates on economic growth of the Nigeria for the period 1981 to 2020. To carry out this study five research objectives and research questions formulated that evolved five hypotheses. The study adopted the ex-post facto design which utilized secondary data that were inputted into the E-views 9 Econometric Software to produce the cointegration test results via The ARDL Bounds test, short run and long run estimates of the model, the granger causality test results, the diagnostic test results and forecast. The macro-economic variables that were utilized in the model were Real Gross domestic product (a proxy for economic growth), GOREV, GOEXP, UNEMRATE and INFLR. Findings from the study showed GOREV, GOEXP, UNEMRATE and INFLR were statistically significant in the long run. There was also evidence of cointegration in the model. On the basis of the findings made, it was concluded that macro-economic aggregates have impacted on economic growth of the Nigeria. On the basis of recommendations, it was recommended that GOREV and GOEXP be regulated to avoid gyrations in the long run; and UNEMRATE and INFLR macro-economic aggregates should be carefully managed to play greater positive role in the economy in the long run

SECTION ONE

INTRODUCTION

1.1 Background to the Study

The debate on the key drivers of economic growth has been ongoing and it is still far from over (Nihat, Ali &Emrah, 2013; Mbulawa, 2015; Obrimah, 2015). Indeed, the role of macroeconomic stability through stable prices (low inflation), low levels of debt (whether foreign or domestic), free market economy, low levels of unemployment, is considered crucial in engendering sustainable economy (Mbulawa, 2015).

The most important subject of macroeconomics is to develop the proper and efficient macroeconomic tools in order to reach to economic stability and targets. Since the emergence of Keynesian economic paradigm, there has been hot debate as to what these tools would be. The debate which was heavily occurred between Keynesian and Monetarist view, gradually evaluated to comparing the monetary and fiscal policies and trying to prove the advantage of one against the other. There is, however, a common belief that in recent years the monetary policy overtook the fiscal policy in most economies. However, the means to the desired is more of the objective rather the methodology.

While fiscal policy is conventionally associated with the use of taxation and public expenditure to influence the level of economic activities, its implementation is essentially routed through government's budget (Doh-Nani, 2011; Erne and Atan, 2013). The budget is therefore, more than a plan for administering the government sector; it both reflects and shapes a country's economic life. In fact, the most important aspect of a public budget is its use as a tool in the management of a nation's economy (Ekpo, 2003; Latif and Ismail, 2009). When there is economic recession or depression, government plans for budget deficit which is often referred to as expansionary fiscal policy. In this situation, taxes are reduced and government expenditure is increased. The implication of this is that by reducing taxes, purchasing power of individuals is enhanced and the cost of production by corporate bodies reduces thereby improving their scale of operations. Similarly, increase in public expenditure if efficiently utilized could translate into improved infrastructural development and consequently enhanced general welfare and also put the economy on the path of growth (Sanchis-i-Marco, 2011; Medee and Nenbee, 2011; Nwaeze, Njoku and Nwaeze, 2014).

On the other hand, is the use of monetary policy to stimulate the growth of the economy. This involves the use of monetary aggregates to control the availability and volume of credit to grow the economy to meet broad macro-economic goals like the case with fiscal policy. This necessitates the use of interest rate and other monetary tools such as bank rate and inflation rate to achieve such.

These methods have something in common and it is the fact they represent macro-economic aggregates utilized by economist to make projections, policies about the economy with respect to periods of economic recession or depression as the case maybe. The overall objective of the use of these aggregates has been to achieve economic growth and maintain stabilization in the long run. Prior to the 21st century, Nigeria had its own fair share of the prolem of sustainable economic growth which has forced her into adopting policies and programmes. For instance, Nigeria adopted the capitalist economic system and was motivated to try the mixed economy. Furthermore, she adopted the famous structural adjustment programme of 1986 when faced with growth and development challenges. However, the results have not been favourable and one clear indication comes from the fact that economic aggregates need careful after thought before been tinkered with in the first place. For instance, the deregulation of the economy, the operation of the second tier Foreign exchange market, removal of subsidy, devaluation of exchange rate e.t.c prove that macro-economic aggregates were only ineffective because they were not given the right attention and policy direction in the first place; hence it has neither been a question of fiscal or monetary

policy issue, but rather, the adequate mix of aggregation of most impacting variables that can achieve rapid economic growth projection.

Among the potent economic variables that broadly affect the economy are inflation rate, unemployment rate, government revenue and government expenditure. These variables have been adduced to be high impact variables that affect majorly; resource mobilization, stabilization and economic growth in the long run. Many researchers have had to contend with the potency of these variables in their academic literatures; however, there is no consensus on the most dominant variables that can be the desired goals of economic growth. Often times than not, it comes with policy conflict in the end.

For instance; The post-Keynesian endogenous theory of money by Kaldor (1970) negates the contention of the monetarists that the Central Bank exogenously determined money supply and therefore its direct impact on the price level in the economy. For Kaldor, the dependent variable is actually the supply of money which is determined by the price level as dictated by the level of money wage rates. The rational expectation approach was postulated by Lucas (1972). It states that the forward-looking expectation adjustments of economic agents will ensure that the pre-announced policy fails where the people are able to anticipate such policy announcements ceteris paribus.

Another instance is from The Phillips curve-unemployment trade off. Prior to the emergence of the Phillips curve, both Keynesian and the Monetarists failed to examine the nexus between inflation and unemployment which were treated as different subjects. Specifically, the Phillips curve tried to determine whether the inflation-unemployment link was causal or simply correlational. However, Friedman (1956) disapproved Phillip's curve thesis, stating that the trade-off between unemployment and inflation only existed in the short-run and that in the long-run, the Phillips curve is vertical. This is because in the long run, workers and employers will take inflation into account, resulting in employment contracts that increase pay at rates near anticipated inflation. In Nigeria, rising inflation rate without a corresponding increase in the wage level of workers has led to a drop in the growth rate in the economy. This rise in inflation can be traced to high interest rates and the falling value of the naira against the dollar.

According to the Okun's law, an increase in unemployment rate will lead to a decline in the potential growth which is to be achieved by the economy, thus an inverse relationship exists between unemployment and economic growth. Thus from the above arguments, one important question begs for an answer- which broad macro-economic variables are responsible for sustainable growth and development of any economy and how are they to be managed in the long run? Or rather which macro-economic variables are responsible for sustainable growth and development of any economy?

1.2 Statement of the Problem

Among the greatest challenges of the Nigerian economy today are the issues of unemployment, inflation and economic growth, which obviously have not sustained positive economic growth path over the years. Considering the seriousness of the matter and the effect that it could cause on the entire economy, the government has tried its hands on fiscal and monetary policy measures such as government revenue, government expenditure to address the issues of macroeconomic stability/growth and achieve other broad objectives (Anidiobu, 2017). And these desirable broad objectives include increasing employment level, stability in price level, equality in income distribution, increase in the balance of payment positions and economic growth in the long run.

Despite the seeming concerted effort of the government to move the economy to a higher level of growth, there is still the prevalence of growth challenges in the areas of galloping inflation, dwindling reserves and savings and high rate of unemployment. These challenges have been borne out of economic mismanagement; however, the cause, the government has not been able to tackle the problem head on by examining the practical and remote causes; hence developing a domestic means of solving the problem. In

other words, the problem with the Nigerian economy exists and persists due to the idea of alien solution without recourse to the idiosyncracies of the economy of Nigeria. Against this backdrop, there is therefore the need to empirically determine the effect of key macro-economic aggregates on economic growth in terms of which variables or aggregation of variables are capable of resolving these attendant problems.

1.3 Objectives of the Study

The specific objectives of this study are as follows:

i. To find out if there exist any significant relationship between government revenue and economic growth of Nigeria.
ii. To find out if there exist any significant relationship between government expenditure and economic growth of Nigeria**.**
iii. To find out if there exist any significant relationship between unemployment rate and economic growth of Nigeria.
iv. To find out if there exist any significant relationship between inflation rate and economic growth of Nigeria.
v. To find out if there exist any significant joint relationship between macro-economic aggregates and economic growth of Nigeria.
vi. To find out if there exist any causality between macro-economic aggregates and economic growth of Nigeria.

1.4 Research Questions

The following research questions were formulated for this study and they include:

i. To what extent does government revenue impact on growth of the Nigerian economy?
ii. To what extent does government expenditure impact on growth of the Nigerian economy?
iii. To what extent does unemployment rate impact on growth of the Nigerian economy?
iv. To what extent does inflation rate impact on growth of the Nigerian economy?
v. Is there a joint relationship between the explanatory variables and growth of the Nigerian economy?
vi. Is there any causality between macro-economic aggregates and growth of the Nigerian economy?

1.5 Research Hypotheses

The following hypotheses were formulated for this study and they are stated in terms of the null hypotheses as follows:

H_{01}: There is no significant relationship between government revenue and economic growth of Nigeria.
H_{02}: There is no significant relationship between government expenditure and growth of Nigerian economy.
H_{03}: There is no significant relationship between unemployment rate and growth of Nigerian economy.
H_{04}: There is no significant relationship between inflation rate and growth of Nigerian economy.
H_{05}: There is no significant joint relationship between the explanatory variables and economic growth of Nigeria.
H_{06}: There is no causality between macro-economic aggregates and economic growth of the Nigeria.

1.6 Significance of The Study

This study will be of utmost significance to the following:

i. Policy makers: This research study will be of immense significance to policy makers in aiding them in formulating growth policies that will produce direct effect on the economy. It will enable them understand the economy better from the sectors that have strong correlation with the economy as well as how they propel the economy via their transmission mechanism

ii. Researchers: This research study will aid further researches to be carried out to make improvements and examine areas that were hitherto not examined. That way, gaps in the study would be closed, variables extended and empirical conclusions made in the long run.

1.7 Scope of The Study

This research study focuses on selected macro-economic aggregates and economic growth of Nigeria. It lays emphasis on key selected macro-economic aggregates such as variables like Unemployment rate, inflation rate, government revenue, government expenditure and real gross domestic product. The period 1981-2020 was chosen to assess any impact from a long run point of view.

1.9 Organization of the Study

This work is organized into five basic sections. Section one covers the introductory aspect which comprised the background of the study, statement of the problem, objective of the study, scope of the study, limitation of the study, organization of the work and terms used in the study. Section two dealt on the literature review, while section three bothered on the research methodology adopted for the study. Section four; the data analysis and test of hypotheses and section five; the summary and conclusion of the research study.

SECTION TWO

REVIEW OF RELATED LITERATURE

2.1 Conceptual Framework

2.1.1 The concept of Macro-economic variables

The importance of macroeconomic variables as suggested by Chipote and Makhetha-Kosi (2014) has made its potency to impact on economic growth of prime concern to most governments. According to Ismaila and Imoughele (2015), Macroeconomic variables refer to those variables of Government aimed at the aggregate economy, usually to promote the macro goals of full employment, stability, and growth. Common macroeconomic policies are fiscal and monetary. Fiscal policy is the macroeconomic policy where the government makes changes in government spending or tax to stimulate economic growth while monetary policy deals with changes in money supply or changes with the parameters that affects the supply of money in the economy. The objectives of this policy include the achievement of sustainable economic growth and development, stable price and full employment. Some of the objectives set are potentially in conflict with each other, which means that, in attempting to achieve one objective, another one is 'sacrificed'. For example, in attempting to achieve full employment in the short-term price inflation may occur in the longer term.

2.1.2 An overview of selected macro-economic aggregates

i. Inflation Rate

Inflation and its effects to the economy have been a major concern to most of the developing countries

including Nigeria. Most scholars believe that inflation is simply a monetary phenomenon caused by high growth rate of money supply in the economy. They see inflation as a general and persistent increase in prices of goods and services within a given period of time as a result of excessive injection of money to the economy.

There are different lines of thought on what the causes of inflation are. To the monetarists, inflation is caused by excessive monetary growth in the system. This simply means that the rate of increase in the money stock is substantially in excess of the rate of growth of real output, an argument earlier advanced by Friedman (1956, 1960 and 1971). His argument is that changes in the injectiontion of money to the system will cause changes in money supply and also, prices. It follows, therefore, that an increase in money supply is likely to cause an increase in prices, and hence inflation.

According to Nigeria Economic Report (2013), Inflation has remained stubbornly high in Nigeria which is contrary to some expectations, given the tightening of macroeconomic policy, CPI inflation still registered at 12% in 2021. Government's resort to money creation to finance its expenditure increases the nominal stock of money and consequently increases demand for goods and services. If output does not grow in tandem to meet this, increase in demand, an upward pressure on prices will result which will increase government deficit and cause inflation.

ii. Unemployment Rate

One of the major macroeconomic goals which the government strives to eradicate is unemployment. Rising rates of unemployment and inflation paint a picture of unsatisfactory macroeconomic performance of an economy. Unemployment is defined as the condition where proportion of people seeking for jobs far exceeds the number of people actively engaged cos. According to Ugwuanyi (2004) unemployment level is one of the yardsticks of performance measurement in every economy. The international Labour Organization estimated that global unemployment reached 210 million people in 2010. Unemployment is an economy "career" that slows down the pace of development in every economy.

Unemployment not only represents a high social cost for the individual, it also represents a high economic cost for the society (Sanchis-i-Marco, 2011).

While official statistics place Nigeria among the fastest growing economies in the word, more direct economic and social welfare indicators appear to tell another story. Estimated poverty rates declined only marginally between 2003 2004 and 2009-2010, implying that, given growth in the population, the number of Nigerians living in poverty is increasing significantly as a result of unemployment (Nigeria Economic Report, 2013).

According to Nigeria Economic Report, official unemployment rate has steadily increased from 12% of the working age population in 2006 to 24% in 2011. Zagler (2009) opined that economic growth is driven by structural stance which usually has a cost associated with it in terms of unemployment because labour markets may not be flexible enough, leading to delays in the adjustment to such changes. To achieve a considerable reduction in the rate of unemployment means some stringent measures have to be taken in respect to the fiscal policies. There is an ever growing body of literature on the causes and effects of unemployment. However, little of this literature specifically provides scarce empirical evidence of the impact of unemployment on long-run economic growth and development.

iii. Government revenue.

The constitution of the Federal Republic of Nigeria Section 162 (10) of 1999 constitution defines revenue as "any income returns accruing from or derived by the government from any source and includes:

-Any receipt however described arising from the operation or any law.

- Any receipt however described from or in respect of any property held by the government.

- Any returns by way of interest or loans and individuals in respect of shares or interest held by the government in any company or statutory body''

Public revenue could be described as the funds generated by the government to finance its activities. In other words, revenue is the total fund generated by the government (Federal, state and local government) to meet their expenditure needs for the fiscal year. Government revenue includes all amounts of money (i.e. taxes and fees) received from sources outside the government entity. Large governments usually have an agency or department responsible for the collection of government revenue from companies and individuals. Government revenue may also include reserve bank currency which is printed and this is recorded as an advance to the retail bank together with a corresponding currency in circulation.

i.v. Government expenditure

Government expenditure often referred to as Public expenditure can be defined as the expenditure incurred by public authorities like the central, state and local governments to satisfy the collective wants of the people. It is basically, spending made by the government of a country on citizen's needs and items such as pension, provision of infrastructure etc.

Bhatia (2008) defines Public expenditure as the expenses which a government incurs for (i) its own maintenance, (ii) the society and the economy, and (iii) helping other countries. Public expenditure refers broadly to expenditure made by local, state and national government agencies as distinct from those of private individuals. Public Expenditure also comprises of government payments for the goods and services acquired and for the works done pursuant to their respective laws, social security contributions, interest payments of domestic and foreign debts, general borrowing expenditures, payments resulting from the discounted sale of borrowing instruments, economic, financial and social transfers, donations and grants, and others.

Public expenditure was restricted only to a small extent till the 19th century due to laissez faire followed by the government, as the classical then believed that money left in private hands could bring better returns. It was only in the 20th century when john Maynard Keynes pointed out the important role of public expenditure in determining the level of income and distribution in the economy. Ever since, government expenditure has been on the increase. In developing countries, public expenditure policy not only accelerates economic growth and promotes employment opportunities, but also plays a useful role in reducing poverty and income growth inequalities in income distribution.

v. The concept of economic growth

According to Aigbokhan (2014), economic growth means an expansion in the average rate change in national output or income in a given period. Economic growth is the increase of per capital gross domestic product (GDP) or other measure of aggregate income. It is often measured as the rate of change in real GDP. Economic growth refers only to the quantities of goods and services produced. Godwin (2013) defines income growth as an increase in real gross domestic product (GDP). That is, gross domestic product adjusted for inflation. The growth can either be positive or negative. Negative economy is reducing. This is distinguished by economic downturn and economic decline. Ullah and Rauf (2013) noted that whenever there is growth in GDP of a country, it will boost up the overall output and we say economic growth is helpful to expand the income of the society, reduce the level of unemployment and also helpful in the conveyance of public services.

According to Odusola (2012), though economic growth is related to a rise in capital per head, capital is not the only requirement for growth. To Folorunso (2013), growing economies provide the means for people to enjoy better living standards and for people to find work, the most observed economic measure

is economic growth, it tells the rate at which the economy is producing compared to previous times. Profit is maximized when an economy is producing at a high level, and stock prices rise, this provides companies with more capital to invest and increase the level of employment. As more jobs are created, incomes rise; this gives consumers additional cash to purchase more products and services, increasing economic growth, for this reason, all countries want positive economic growth. Economic growth is determined by changes in the gross domestic product, or GDP, this calculates a country's total produce for the previous year. Goods and services produced for sale are put into consideration, undermining whether it is sold within the country or sold abroad.

According to Balami (2014) economic growth which is always proxied by GDP is often conceptualized as increase in output of an economy's capacity to manufacture goods and services useful to improve the well-being of the country's citizens. Growth is significant when growth rate is rises above population growth because it has to lead to improvement in human welfare. Therefore, growth is seen as a firm procedure of increasing the profitable capacity of the economy and hence, of increasing national income being characterized by higher rates of increase of per capita output and total factor productivity, especially labor productivity.

Vi. NEW ECONOMIC GGROWTH THEORY

According to Daniel Liberto in investopia of 26th February 2021 review, it explained and described the new growth theory is an economic concept, positing that humans' desires and unlimited wants foster ever-increasing productivity and economic growth. It argues that real gross domestic product (GDP) per person will perpetually increase because of people's pursuit of profits.

A significant aspect of the new growth theory is the idea that knowledge is treated as an asset for growth that is not subject to finite restrictions or diminishing returns like other assets such as capital or real estate. Knowledge is an intangible quality, rather than physical, and can be a resource grown within an organization or industry.

New Growth Theory Example

Under the new growth theory, nurturing innovation internally is one of the reasons for organizations to invest in human capital. By creating opportunities and making resources available within an organization, the expectation is that individuals will be encouraged to develop new concepts and technology for the consumer market.

For example, a large enterprise might allow part of its staff to work on independent, internal projects that may develop into new innovations or companies. In some ways, the enterprise lets them function like startups being incubated inside the organization.

The desire of the employees to launch a new innovation is spurred by the possibility of generating more profits for themselves and the enterprise. This can be especially true in the United States, as commerce is increasingly driven by service-type companies. Software and app development may take place within companies, following the new growth theory.

Achieving such knowledge-driven growth requires a sustained investment in human capital. This can create an environment for skilled professionals to have an opportunity to not only fulfill their primary jobs but also explore the creation of new services that can be of benefit and use to the broader public.

Special Considerations

New growth theorists believe that companies generally undervalue the usefulness of knowledge and, as a result, argue that it is mainly up to governments to invest in human capital. Governments are encouraged to facilitate access to better education, as well as provide support and incentives for private-sector research and development (R&D).

2.2 Government Expenditure and Economic Growth

Public expenditure can help the economy in numerous ways in attaining higher levels of production and growth. The ways in which such effect might be brought about are obviously inter-related. The analysis of these effects can be taken up separately in the context of developed and developing economies (Bhatia, 2008). According to Dalton (1954), public expenditure tends to affect the level of production in three possible ways:

1**. Effect on the Capacity to Work and Save**: Public expenditure provides various kinds of social and economic facilities stimulating the capacity to work of the people. Increased capacity implies increased efficiency and greater employment. Level of income and saving tends to rise, facilitating greater investment and adding the pace of growth. Dalton opines that 'just as taxation reduces an individual's capacity to work, in the same way public expenditure increases the individual's capacity to work.'

2. **Desire to Work and Save**: Public expenditure induces the public's willingness to work and save. As a result, their income and standard of living rise.

3. **Redistribution of Economic Resources**: Public expenditure makes the economy balanced by redistributing the income resource from unproductive activities to productive ones. This results in increase in production. This effect varies between developed and developing countries.

The developed countries have enough of production capacity, but its optimum utilization does not take place as a result of low demand. Consequently, there is low level of production. By increasing public expenditure, aggregate demand can be increased. Wealth can be distributed by increasing public expenditure among those who are willing to spend. Thus increase in demand results in the increase in production. In the event of full employment already existing in the economy, increase in public expenditure will only increase prices instead of production. Bhatia (2008) cautions that to maximize the benefits of public expenditure and to avoid possible harmful incidental effects,

Firstly, the various projects have long gestation period, in which case the output is delayed. Yet they need to be funded, adding to the inflationary pressures. Care must therefore be taken that inflationary pressures are put under control during the process of development.

Secondly, on account of faulty planning and execution, a lot of wastage can take place in public expenditure. This must be avoided.

Thirdly, given the scarce resources, care must be taken to choose the most appropriate and most useful projects. Cost-benefits study may be needed to prioritize the projects.

Fourthly, a careful decision has to be taken regarding the volume of public expenditure in various projects and on various measures expected to stimulate investment. The effects of the sources of financing the compositions of public expenditure must be considered.

Public expenditure can also prove helpful in accelerating the rate of economic development. In order to maintain a steady growth rate in developed economy, public expenditure can be helpful in maintaining the

adequate amount of investment and consumption expenditure, so that the full employment rate of the economic development is steadily maintained. Public expenditure is used for allocation, stabilization and distribution of resources (Musgrave and Musgrave, 1989). The allocation function becomes necessary so as to provide both private and in particular, social goods in appropriate mix with available resources. Due to special characteristics of goods (spillover, externalities, non- excludability/joint consumption, non-rivalries) they will not be provided at all, or where they are produced the output will be inadequate and outrageously costly if left in the hands of private individuals, the government intervenes using the instrument of public expenditure and other fiscal policy tools.

Stabilization function of public expenditure is that of maintaining high employment, a reasonable degree of price stability an appropriate rate of economic growth, with allowance for effect on trade and on the balance of payment. That is the stabilization function is concerned with the attainment by the national economy of full employment and capital utilization at stable price, a good balance of intervention performance and a satisfactory rate of growth in per capita income over a period of time.

2.3 Theoretical Framework

2.3.1 Revenue Theory: The Theory of Fiscal Policy.

This theory suggests that governments raise revenue and use the collected revenues to finance public investments for the provision of public goods and services as well as targeted developmental projects. Policy decisions are made by the government, which decides on how best to allocate the collected limited revenue to alternative competing sectors (Hassler et al, 2007; Battaglini and coates, 2008). In developed countries, as in developing countries play a key role in the provision of public goods and services. Choices have to be made on how to allocate the limited resource, so governments force tradeoffs (Khattry, 2003).

These tradeoffs are summarized by Khattry (2003) in these illustrations. The first involves the tradeoff between public spending on physical infrastructure and human capital. Because of substantial costs involved in capital investments, the involvement of the private sector is limited; thus, the government takes a large share of the burden to undertake such investments.

The second case is allocating resources between defense spending and spending on physical and human capital investment. It is contended that governments in developing countries facing deteriorating political and social conditions tend to invest in military apparatus in order to maintain political authority, while compromising physical and human capital investment.

The third is the concern of allocating resources between public investment in both physical and human capital infrastructure and interest payments on accumulated debt. Developing countries which have accumulated large debts have reduced spending on investments in order to service the debt and qualify for new borrowing to meet spending obligations.

This theory fits into our theoretical framework for this study because it shows the link between the causality between government revenue and expenditure and why they are as a result. Thus, lending support to causality link between revenue and expenditure which will be explained below.

2.3. 2 The Classical Theory of growth.

With the emergence of the classical economists, the liberal economic views began to emerge. The classicists were opposed to expanding government function beyond governance and added that it would mean a bigger budget and a bigger tax. They advocated small government and sound budgetary principle. In the classical view the best budget was a small budget and a balanced budget which taxes the people the least. To ensure that the budget is kept low, the classicists held that government should not stray into the

domains of the private sector. According to them, the duty of government was to create an enabling environment for business to thrive. Smith in (Edame, 2004). Economic activities should therefore be left alone to entrepreneurs to perform under the regulatory influence of competitions. The classical school argued that free trade and not regulation protection was capable of maximizing the welfare of the people. The greatest good for the greater number was a welfare criterion. The utilitarian principle on the welfare criterion became the hallmark of the classical economic theory.

2.3.3 The Keynesian Theory (fiscal policy)

This theory opines that fiscal policy is the main tool for the management of the economy. According to the Keynesians, fiscal policy has a direct impact on the economy. In his theory, Keynes asserted that to steer the economy out of depression, government must ensure full employment and to increase the level of consumption on the part of the people and hence aggregate demand. His contention is that government is best suited to achieve this by its power to tax the people and by using the revenue collected to increase the volume of its public spending. That is expending on the provision of social goods and services (Keynes, 1936).

The Keynesian model was initially developed during the great depression scenario, economist struggle to explain the worldwide economic collapse and find policy to help the economy to normalize. The early Keynesian stressed that with the aid of fiscal policy, government decision about expenditure and taxes can significantly affect output and employment levels. The Keynesians believe that with effective fiscal policy of government, the GDP gap which is caused by deflationary gap will be eliminated.

2.3.4 The Monetarist Theory

According to the monetarist, money was viewed as a very important variable. They believed that if money supply is properly monitored, controlled and adjusted, then aggregate expenditure process and unemployment will automatically be adjusted therefore leading to a smooth running of the economy.

In other words, they maintained that the fluctuation experienced in the economy will naturally adjust to full employment at a given time. It has been argued that the level of government spending should be determined on the basis of the economy (Friedman, 1984).

Although critics argue that there are significant time lags in the operation of fiscal policy. By the time a particular policy is actually implemented, the economic circumstances may have changed such that the policy becomes inappropriate. Thus, the monetarist in a bid to conclude asserted that fiscal policy is not an omnipotent stabilization policy, but admitted that fiscal policy influences economic growth and development (Friedman, 1976).

2.3.5. Theory of Economic Growth.

Economic growth got its root from the works of Irving fisher (Diamond, 2013.) who laid the foundation of the quantity theory of money through his equation of exchange. In his proposition money has no effect on economic aggregates but price. However, the role of money in an economy got further elucidation from (Keynes, 1930) and other Cambridge economists who proposed that money has indirect effect on other economic variables by influencing the interest rate which affects investment and cash holding of economic agents. The position of Keynes is that unemployment arises from inadequate aggregate demand lv which can be increased by increase in money supply which generates increase spending, increase employment and economic growth. However, he recommends a proper blend of monetary and fiscal policies as at some occasions, monetary policy could fail to achieve its objective. The role of monetary policy which is of course influencing the volume, cost and direction of money supply was effectively conversed by Friedman, (1968), whose position is that inflation, is always and everywhere a monetary phenomenon while recognizing in the short run that increase in money supply can reduce unemployment

but can also create inflation and so the monetary authorities should increase money supply with caution.

2.5. Review of Empirical Literature

Diverse scholarly opinions have evolved from studies and literature reviews on the nexus between direct macroeconomic variables and economic growth in Nigeria; some conform while others contradict the existing position. Despite dearth of literature on this important subject matter, there has been mix of results from studies as result of different approaches and methodology.

Bawa and Abdullahi (2012) examined the threshold effect of inflation on economic growth in Nigeria. They made use of quarterly time series data covering1981 – 2009 to achieve inflation threshold in Nigeria. Applying a threshold model developed by Khan and Kumar (2012), a threshold level of 13 per cent was estimated for Nigeria. Hence below this level, inflation is insignificant; while above the negative magnitude is highly significant. These relationships are quite robust with respect to changes in econometric methodology, additional explanatory variables and changes in data frequency. The findings of the study is quite useful in monetary policy formulation, because optimal target of inflation can be set and achieved with ease, which further points to a long term sustainable economic growth goals of the country.

Umaru and Zubairu (2012) investigated the impact of inflation on economic growth and development in Nigeria between 1970-2010. Unit root and Granger Causality tests were performed to understand the stationary status of the variables and direction of causation respectively. However, all variables were found to be stationary and that GDP causes inflation but inflation does not cause GDP. Furthermore, inflation possesses a positive impact on economic growth by encouraging productivity plus the evolution of total factor productivity. The study then concluded that policymakers should make effort to increase output level in Nigeria through improved productivity. This will help reduce prices of goods and services, so that growth will be boosted. Recall that inflation can be reduced to the barest minimum through increase output level (GDP).

Antwi, Mills and Zhao (2013) studied the impact of macroeconomic factors on economic growth in Ghana. The researchers employed error correction model (ECM) and carried out tests such as Augmented Dickey Fuller (ADF), Johansen cointegration and found that long run economic growth in Ghana is explained by physical capital, foreign direct investment, foreign aid, inflation and government expenditure. Yet, Kira (2013) found that some variables were inactive such as Investment and Imports indicating that their influence on GDP is not significant.

Kolawole (2013) empirically examined the growth effects of macroeconomic stability factors in Nigeria. Using time series data for the period 1980 to 2011 and adopting various econometric techniques such as Granger causality test, and Error Correction Mechanism (ECM). The results revealed that real interest rate has direct and significant effects on Nigeria economic growth while external debt and real exchange rate impact negatively on growth in the country.

Akeju and Olanipekun (2014) examined unemployment and economic growth in Nigeria through the use of ECM and Johansen Co-Integration test with data set from 1980-2010. The evidence of the study revealed a there is both the short and the long run relationship between unemployment rate and output growth in Nigeria. Yet, Arewa and Nwakanma (2012) and Oloni (2013) had come to a different conclusion.

Adeniran, Yusuf and Adeyemi (2014) investigated the impact of exchange rate fluctuation on the Nigerian economic growth using OLS method, correlation and regression analysis and found that interest rate and rate of inflation have negative impact on economic growth, but this is not so significant. Also found was that exchange rate has positive but not significant impact on economic growth. This was supported by Rasaq (2013) and Obrimah (2015). Contrary findings were reported by Azeez and Kolapo (2012) and Okorontah and Odoemena (2016).

Nwoye, Obiorah and Ekesiobi (2015) investigated the effect of Nigeria's macroeconomic environment on the performance of the national economy. Using the OLS method and found that unique relationship exists between the country's national currency exchange rate to a US dollar, inflation rates, monetary policies, and the extent or level of GDP growth the country. Agwu (2014) obtained a different result while carrying out a survey on factors that contribute to economic growth in Nigeria with data for the period between 1981 and 2012 using the VECM model.

Ismaila and Imuoghele (2015) used cointgration and OLS to examine the macroeconomics determinants of economic growth in Nigeria from 1986 to 2012. The cointegration result showed the existence of long run relationship among the variables. Ordinary Least Square results showed that gross fixed capital formation, foreign direct investment and total government expenditure are the main determinants of Nigeria economic growth.

Inyiama (2013) examined the link among inflation, interest and exchange rates on economic growth in Nigeria. Employing the ordinary least square method to a data set of 1979-2010 for each of the variables, a multiple regression was adopted. Unit root test (Johansen & Juselius co-integration techniques) to ascertain existence of possibility of the sustainability short run relationship in the long run and Granger Causality test were perfumed on the model. It was found that inflationary rate is negatively related with real gross domestic product while a positive relationship existed for exchange rates and interest rates though not significant. This is sustainable even in the long run and the implication is that when inflationary rate is rising, it affects the economy negatively as growth is dampened. On causality, no causality was found at both lag 2 and lag 4, between inflation rate lxxix and real gross domestic product. But at lag 2, a unidirectional causality running from inflation rate to interest rate and also a unidirectional causality running from interest rate to real gross domestic product were noticed. At lag 4, a unidirectional causality from interest rate to inflation rate, so also causality between interest rate to exchange rate, and also a unidirectional causality running from exchange rate to real gross domestic product. It was then submitted that efforts should geared towards a single digit level, thus enhance growth leading to development in Nigeria economy, making the macroeconomic better-off and alive.

Chukwu (2013), analyzed the effect of monetary policy innovations in Nigeria. The study used a Structural Vector Auto-Regression (SVAR) approach to trace the effects monetary policy stocks on output and prices in Nigeria. The study also analyzed three alternative policy instrument, that is, broad money (M2), minimum rediscount rate (MRR), and the real effective exchange rate (REER). The study found evidence that monetary policy innovations have both real and nominal effect on economic parameter depending on the policy variable selected.

Osuala and Onyeike (2013) examined the impact of inflation on economic growth. A forty-year time series data sourced from Central Bank of Nigeria (CBN) was analyzed. Various tests variables to ascertain existence of stationary (ADF, PhilipPerron (PP)), granger causality performed on the variables to estimated direction influence between them. The results show that there exists a statistically significant positive relationship between inflation and economic growth in Nigeria, but there was no leading variable

in the relation between inflation and economic growth in Nigeria. The paper therefore concluded that the effect is simultaneous. Since there exists a positive relationship between inflation and economic growth in Nigeria, instead of spending billions of naira in negotiation for "debt forgiveness", the government should "inflate away her debt".

Adefeso and Mobolaji (2014) also investigated fiscal - monetary policy and economic growth in Nigerian by employing Jabansen Maximum Likelihood Co-integration procedure. The result shows that there is a long – run relationship between economic growth, degree of openness, government expenditure and broad money supply (M2).

Owalabi and Adegbite (2014) examined the impact of monetary policy on industrial growth in Nigerian economy lxxxiii using multiple regression analysis. They analyzed the relationship between manufacturing output, treasury bills, deposit and lending, and rediscount rate and industrial growth, and found that the variables have significant effects on the industrial growth.

Michael and Ebibai (2014) examined the impact of monetary policy on selected macroeconomic variables such as gross domestic product, inflation and balance of payment in Nigeria using OLS regression analysis. The result shows that the provision of investment friendly environment in Nigeria will increase the growth rate of GDP.

kujobi (2014) investigated the impact of monetary policy instrument on economic development of Nigeria using multiple regression technique and found that treasury bill, minimum rediscount rate and liquidity rate have significant impact on economic development of Nigeria.

Chukwu (2013), analyzed the effect of monetary policy innovations in Nigeria. The study used a Structural Vector Auto-Regression (SVAR) approach to trace the effects monetary policy stocks on output and prices in Nigeria. The study also analyzed three alternative policy instrument, that is, broad money (M2), minimum rediscount rate (MRR), and the real effective exchange rate (REER). The study found evidence that monetary policy innovations have both real and nominal effect on economic parameter depending on the policy variable selected.

2.6 Gap in the Literature

Many related studies have been carried out on macro-economic variables and economic growth of Nigeria with the debate on which variables have more causality effects on economic growth in the long run. While many of them focused on variables that affect the internal and external workings of the economy; this study takes a look at only the internal variables that are considered to stimulate economic growth from an endogenous perspective. Thus, this study makes a departure from the broad aggregation to a narrower , yet growth driven analysis.

SECTION THREE

RESEARCH METHODOLOGY

3.1 Research Design

This research study utilized Ex-post facto research design and developed a model to investigate "The impact of macroeconomic aggregates on economic growth of Nigeria: 1981-2020". Ex-post facto is a

research after the facto has been known and it applies to secondary data (Anyanwu, 2003). Based on the nature of this research study, secondary data was employed.

The E-view 9 Econometric software was utilized in estimating the effect of federal government revenue and expenditure on economic growth in Nigeria. It first determined the stationarity of the variables via unit root test; next it determined the existence of long run relationship in the model via bounds tests; estimated the linear relationship between the dependent variable and explanatory variables via ARDL Model for the short run and long run estimates; causality; violation of classical assumptions, model stability and model forecast.

3.2 Source of Data

The data for this study was obtained from the National Bureau of Statistics (2020) and CBN Bulletin (2020) edition.

3.3. Model Specification

In an attempt to investigate "macro-economic aggregates and economic growth of Nigeria: (1981-2020)", the work of "Akeju and Olanipekun (2014) on unemployment and economic growth of Nigeria was reviewed. Their study through the use of ECM and Johansen Co-Integration test with data set from 1980-2010, found evidence of a long run relationship. Furthermore, the study revealed there is both the short and the long run relationship between unemployment rate and output growth in Nigeria.

However, this study seeks to improve on his study by using Real Gross domestic product (dependent variable proxy for economic growth), Government revenue, Government expenditure, Unemployment rate and inflation rate as explanatory variables. Hence the adjustment in the previous work gave rise the endogenous growth model can be written in its functional form as:

LNRGDP= *f* (LNGOREV, LNGOEXP, LNUNEMP, LNINFLR)

In econometric form:

$$\mathbf{LNRGDP=b_0+b_1LNGOREV+b_2LNGOEXP+b_3LNUNEMP+ b_4LNINFLR+ \mu}$$

Where:

RGDP = Real Gross Domestic Product (proxy for economic growth).

GOREV= Total Government revenue.

GOEXP = Total Government expenditure.

UNEMRATE= Unemployment rate.

INFLR= Inflation rate.

$b_1 - b_4$ are coefficients of parameters estimates and b_0 is the intercept of the model. μ is the white noise error term. The white noise error term inclusion is on the assumption that the error terms of the observations are not correlated and thus; due to measurement error, omission of variables and human factor in specifying the model the error term was included.

It is expected that $b_1 > 0$, $b_2 > 0$ $b_3 < 0$ b and $b_4 < 0$.

3.4. Pre-Estimation Tests

3.4.1 Unit Root Test

This was to test for the stationarity of the time series data. Test for stationarity was done to avoid the problem of spurious regression. Augmented Dickey-fuller was used for this test. The Augmented Dickey-fuller (ADF) statistic when compared with the ADF critical value at 5% level of significance and found to be greater in absolute value, we rejected the null hypothesis that a unit does exist, otherwise, we accepted it. The unit root test played an important role in data analysis because it determined the method of estimation of the parameter estimates to be employed.

Decision rule: Accept the null hypothesis if the Prob.F-test and log likelihood ratio exceed the 5% critical value, except otherwise.

3.4.2 Specification Error Test

This test was developed by Ramsey to investigate if there exist any form of mis-specification in the model. This test uses the Prob.F-test and log likelihood ratio to accept or reject the null hypothesis.

Decision rule: Accept the null hypothesis if the Prob.F-test and log likelihood ratio exceed the 5% critical value, except otherwise.

3.4.3 Cointegration Test

The ARDL form for cointegration (Bounds test) states that if F-statistics is greater than I(0) and I(1) bounds, it means there is evidence of long run relationship in the model.

To perform the ARDL Bounds test, 5 cointegration tests are carried out and the hypotheses are stated as follows:

H_o: $\beta_1=\beta_2=\beta_3=\beta_4=\beta_5=0$

H_1: $\beta_1\neq\beta_2\neq\beta_3\neq\beta_4\neq\beta_5\neq 0$

If there IS NO cointegration, the Dynamic general ARDL (p, q_1, q_2) model can be expressed as:

$$\Delta LNRGDP_t = a_{o1} + \sum_{i=1}^{p} a_{11}\Delta LNRGDP_{t-1} + \sum_{i=1}^{q} a_{21}\Delta LNGOREV_{t-1} + \sum_{i=1}^{p} a_{31}\Delta LNGOEXP_{t-1} + \sum_{i=1}^{p} a_{41}\Delta LNUNEMRATE_{t-1} \sum_{i=1}^{p} a_{51}\Delta LNINFLR_{t-1} + \varepsilon_t$$

On the other hand, if there is evidence of cointegration, the error correction model (ECM) representation is specified as:

$$\Delta LNRGDP_t = a_{o1} + \sum_{i=1}^{p} a_{11}\Delta LNRGDP_{t-1} + \sum_{i=1}^{q} a_{21}\Delta LNGOREV_{t-1} + \sum_{i=1}^{p} a_{31}\Delta LNGOEXP_{t-1} + \sum_{i=1}^{p} a_{41}\Delta LNUNEMRATE_{t-1} \sum_{i=1}^{p} a_{51}\Delta LNINFLR_{t-1} + \lambda ECT_{t-1} + \varepsilon_t$$

$\lambda = (1 - \sum_{i=1}^{p} \delta_i)$, is the speed of adjustment parameter and ECT is the error correction term.

$B_{i=5}$, represents the short run dynamic coefficients of the model's adjustment to long run equilibrium.

3.4.4 Normality Test

This was used to test whether the error terms were normally distributed. The normality test adopted for this study was the Jargue–Bera (JB) statistics which follows a chi-square distribution. If the prob. value of Jargue–Bera (JB) is less 5% level of significance, then the error term is not normally, but if otherwise, we accept the normality assumption.

3.5 Method of Data Analysis

The Autoregressive Distributed Lag (ARDL) model was used for the model estimation. In this research study, data was analyzed based on three criteria: Economic, Statistical and Econometric criteria.

The Economic criterion attempted to create a correspondence of Economic theories with obtained estimates by examining the magnitude of the signs of the parameter estimates. This is also known as the a priori expectations.

The statistical criterion involved the use of statistical tools and E-views 10 software to obtain the parameter estimates. The estimated parameters were analyzed via the t-test, F-test, cointegration test, causality test and model stability test.

The econometric criterion sought to investigate if there were violations of classical Econometric assumptions of no autocorrelation and heteroscedasticity. The interpretation of the data was manually done after the estimation of the parameters from the E-views 10 software.

3.6 Test of Significance

This was to test whether the variables were significant at 5% level of significance individually and jointly. To do this, the t-test was employed to test each of the variables. Stating in terms of null and alternative hypothesis we had:

Ho: $\beta_i=0$, where i =1-4 and

H_1: $\beta_i \neq 0$

Decision rule: Accept Ho if $t_{cal} < t_{tab}$ at $\alpha= 0.05$, otherwise reject H_o.

Alternatively, accept Ho if prob.value > 0.05, otherwise, reject H_o.

On the other hand, the joint test hypothesis is stated as follows:

Ho: $\beta_1=\beta_2=\beta_3=\beta_4=0$; and

H_1: $\beta_1\neq\beta_2\neq\beta_3\neq\beta_4\neq0$

Decision rule: Accept H_o if prob.value > 0.05, otherwise reject H_o.

3.7 Post-Estimation Test

3.7.1 Test for Multicollinearity

The classical assumption has it that there is no presence of near linear relationship among the explanatory variables. To detect this malady, the **Variance Inflation Factor (VIF)** test was used. Numerically,

$VIF = \frac{1}{1-R^2}$, R^2=R-squared.

Decision rule: Accept H_o if prob.value > 0.05, otherwise reject H_o.

3.7.2 Test for Autocorrelation

The classical assumption has it that the error terms of observations do not correlate is the error term of one observation does not influence another. To detect this malady, the **Durbin-Watson** test was used.

Decision rule: Accept H_o if prob.value > 0.05, otherwise reject H_o.

3.7.3 Test for Heteroscedasticity

The classical assumption has it that the error terms of observations have constant variance; otherwise, non-constant variance and this could create problems in the model estimation which is undesirable and violates the classical assumption of constant variance. To detect this malady, the researcher employed the **Breusch-Godfrey-Pagan** heteroscedasticity test which follows a chi-square distribution.

Decision rule: If chi-square F- prob.value is greater than 0.05, it means that there is no serial autocorrelation in the model, except otherwise.

3.7.4 Goodness of Fit of the Model

The adjusted R-squared was examined to test for the Goodness of fit of the model. It explains how much variation in the model was accounted for by the explanatory variables of the model. A value above from 50% and above shows a good fit of the model; except below.

3.8 Forecast

One of the stages of econometric research is to find out if the model can be used for predictive purposes. This implies that a model is only as good as its predictive ability and not otherwise. Thus, the model's predictability will be assessed using the model forecast which will consider the Theil inequality coefficient, bias and variance proportion.

SECTION FOUR

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS.

4.1 Data Presentation.

Table 4.1.1 Time Series Data on Gross Domestic product, Mobile subscriptions, Inflation rate and Real interest rate from 1981-2020.

YEAR	UNEMP (%)	INFLR (%)	GOREV (Nmill)	GOEXP (Nbill)	RGDP (Nbill)
1981	6.5	21.42	13.3	11.4	139.31
1982	6.2	7.16	11.4	11.9	149.05
1983	3.4	20.1	10.5	9.6	158.75
1984	6.2	18.4	11.3	9.9	165.85
1985	6.1	4.61	15.1	13	187.83
1986	5.3	5.4	12.6	16.2	198.12
1987	7	10.2	25.4	22	244.68
1988	5.3	22.9	27.6	27.7	315.62
1989	4.5	18.21	53.9	41	414.86
1990	3.5	7.5	98.1	60.3	494.64
1991	3.1	13	101	66.6	590.06
1992	3.4	19.1	190.5	92.8	906.03
1993	2.7	15.7	192.8	191.2	1257.17
1994	2	18.2	201.9	160.9	1768.79
1995	1.8	19.3	460	248.8	3100.24
1996	3.4	16.2	523.6	337.2	4086.07
1997	3.2	8.5	582.8	428.2	4418.71
1998	3.2	10	463.6	487.1	4805.16

1999	3	6.6	949.2	947.7	5482.35
2000	13.1	6.9	1906.2	701.1	7062.75
2001	13.6	18.9	2231.6	1018	8234.49
2002	12.6	12.9	1731.8	1018.2	11501.45
2003	14.8	14	2575.1	1226	13556.97
2004	13.4	15	3920.5	1426.2	18124.06
2005	11.9	17.9	5547.5	1822.1	23121.88
2006	12.3	8.2	5965.1	1938	30375.18
2007	12.7	5.5	5715.6	2450.9	34675.94
2008	14.9	11.6	7866.6	3240.8	39954.21
2009	19.7	12	4844.6	3453	43461.46
2010	21.1	13.7	7303.7	4194.6	55469.35
2011	23.9	10.8	11116.8	4712.1	63713.26
2012	23.9	12.2	10654.7	4605.4	72599.63
2013	10	8.4	9759.79	4797.45	81009.96
2014	7.8	11.4	10068.85	4210.02	90136.98
2015	9	14.6	6912.51	4650.32	95177.74
2016	13.4	15.1	5679.04	6397.5	102575.42
2017	17.5	14	7317.7	8118.4	114899.25
2018	15.2	16.2	8529.1	8691.7	129086.91
2019	17.69	11.4	10,262.3	6,997.2	145639.14
2020	22.6	13.2	9,303.2	8,121.6	154252.32

Source: The National Bureau Of Statistics (NBS, 2020)

4.2 Data Analysis

4.2.1 Pre-Estimation Test: Lag Length Criteria, Stationarity (Unit Root), Cointegration And Normality Test.

Preliminary analysis was conducted with the aim of determining the lag length, presence of a unit root, presence of cointegration and normality of the data. The lag length is estimated to determine the time spread for the annual data i.e. annually, semi-annually or quarterly. The unit root is to test is the variables oscillate around a common mean value and variance.

Cointegration was aimed at identifying the presence of cointegration among the variables in the long run. With respect to the normality test, this was done to test if the variables followed a normal distribution.

TABLE 4.2.1 A Lag Length Selection Criteria.

VAR Lag Order Selection Criteria
Endogenous variables: LNRGDP LNINFLR LNGOREV LNGOEXP LNUNEMP
Exogenous variables: C
Date: 06/24/22 Time: 12:57
Sample: 1981 2020
Included observations: 37

Lag	LogL	LR	FPE	AIC	SC	HQ
0	11.04488	NA	4.96e-07	-0.326750	-0.109059	-0.250004
1	189.0725	298.3166	1.29e-10	-8.598515	-7.292365*	-8.138036*
2	217.1048	39.39667*	1.18e-10*	-8.762420*	-6.367812	-7.918208
3	233.6748	18.80920	2.30e-10	-8.306745	-4.823679	-7.078801

* indicates lag order selected by the criterion

From the regression result, it was found that the dominant lag is 2 and will be used for further estimations in this study.

Table 4.2.1b Unit Root Test Summary.

VARIABLE	ADF (LEVEL)	5% CRITICAL	ADF(1^{ST}DIFF)	5% CRITICAL	REMARK
LNRGDP	-1.407737	-2.941145	-3.334893*	-2.941145	I(1)
LNGOREV	-1.427700	-2.938987	-6.243867*	-2.941145	I(1)
LNGOEXP	-1.708734	-2.941145	-7.069350*	-2.941145	I(1)
LNUNEMRATE	-1.183801	-2.938987	-6.063804*	-2.941145	I(1)
LNINFLR	-5.132959*	-2.941145	-7.502894	-2.943427	I(0)

The Asterisks (*) is used to indicate stationarity at the 5% level of significance.

The unit Root Test was carried out using the Augmented Dickey–Fuller. From the stationarity test above, the variables were stationary at I(0) and I(1); hence fit for an ARDL model estimation.

Table 4.2.1C Specification Error Test: Ramsey Reset Test

H_{01}: There is no specification error in the model at $\alpha = 0.05$.

H_{02}: There is no specification error in the model at $\alpha = 0.05$.

Equation: UNTITLED
Specification: LNRGDP LNRGDP(-1) LNRGDP(-2) LNINFLR(-1) LNINFLR(-2) LNINFLR(-3) LNINFLR(-4) LNGOREV(-1) LNGOREV(-2) LNGOEXP(-1) LNGOEXP(-2) LNGOEXP(-3) LNGOEXP(-4) LNGOEXP(-5) LNUNEMP(-1) LNUNEMP(-2) LNUNEMP(-3) LNUNEMP(-4) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.669103	16	0.5130
F-statistic	0.447698	(1, 16)	0.5130

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.000244	1	0.000244
Restricted SSR	0.008958	17	0.000527
Unrestricted SSR	0.008714	16	0.000545

Decision: Since the F-statistic (0.5130) > 0.05 the null hypothesis is accepted and it is concluded that there is no misspecification error associated with the model at $\alpha = 0.05$.

Table 4.2.1D: Descriptive Statistics

	LNRGDP	LNINFLR(-1)	LNGOREV(-1)	LNGOEXP(-1)	LNUNEMP(-1)
Mean	3.826542	1.085666	2.841738	2.657235	0.880703
Median	3.915637	1.113943	3.238498	2.976671	0.892095
Maximum	5.188232	1.359835	4.045980	3.939105	1.378398
Minimum	2.173332	0.663701	1.021189	0.982271	0.255273
Std. Dev.	1.024964	0.180999	1.075847	0.990912	0.323076
Skewness	-0.290786	-0.599834	-0.491218	-0.418428	-0.214109
Kurtosis	1.671803	2.457364	1.754814	1.759514	1.807751
Jarque-Bera	3.416291	2.817195	4.087964	3.638595	2.607843
Probability	0.181202	0.244486	0.129512	0.162140	0.271465
Sum	149.2352	42.34099	110.8278	103.6322	34.34743
Sum Sq. Dev.	39.92092	1.244900	43.98301	37.31246	3.966357
Observations	39	39	39	39	39

From the table above, it can be seen that the data distribution has a negative skewness for all the variables i.e. they are negatively skewed

and the kurtosis shows it is leptokurtic i.e. flat tailed distribution. The standard deviation show minimal deviations and this is validated from the comparison of the maximum and minimum values of each variable. Finally, the probability values of each variable are all greater than 5%; hence from the summary of data, it is inferred that the data is normally distributed.

4.2.1c Correlations

VARIABLE	LNRGDP	LNGOEXP	LNGOREV	LNINFLR	LNUNEMP
LNRGDP	1	0.9935	0.9828	-0.0129	0.6917
LNGOEXP	0.9935	1	0.9897	-0.0196	0.6635
LNGOREV	0.9828	0.9897	1	-0.02155	0.6707
LNINFLR	-0.0129	-0.0196	-0.0215	1	-0.0808
LNUNEMP	0.6917	0.6635	0.6707	-0.0808	1

Source: E-views 9 Regression output.

From the table above, all the explanatory variables have a positive and strong correlation with RGDP as seen from their correlation coefficients, with the exception of LNINFLR.

4.3 Model Estimation.

Dependent Variable: LNRGDP
Method: ARDL
Date: 06/24/22 Time: 13:07
Sample (adjusted): 1986 2020
Included observations: 35 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LNINFLR(-1) LNGOREV(-1) LNGOEXP(-1) LNUNEMP(-1)
Fixed regressors: C
Number of models evalulated: 1250
Selected Model: ARDL(2, 3, 1, 4, 3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNRGDP(-1)	1.295139	0.170773	7.583970	0.0000
LNRGDP(-2)	-0.811779	0.173759	-4.671860	0.0002
LNINFLR(-1)	0.081145	0.033430	2.427327	0.0266
LNINFLR(-2)	-0.033734	0.037800	-0.892452	0.3846
LNINFLR(-3)	0.024323	0.031413	0.774297	0.4494
LNINFLR(-4)	0.064833	0.031688	2.045951	0.0566
LNGOREV(-1)	-0.207132	0.058683	-3.529661	0.0026
LNGOREV(-2)	0.104368	0.041051	2.542380	0.0210
LNGOEXP(-1)	0.245955	0.073010	3.368768	0.0036
LNGOEXP(-2)	0.267111	0.075150	3.554358	0.0024
LNGOEXP(-3)	0.040664	0.082976	0.490069	0.6303
LNGOEXP(-4)	-0.140933	0.074633	-1.888337	0.0762
LNGOEXP(-5)	0.198791	0.063057	3.152551	0.0058
LNUNEMP(-1)	-0.028244	0.042306	-0.667626	0.5133
LNUNEMP(-2)	0.048173	0.052151	0.923731	0.3686
LNUNEMP(-3)	-0.050560	0.045372	-1.114335	0.2806
LNUNEMP(-4)	0.123380	0.036870	3.346379	0.0038
C	0.459612	0.094051	4.886835	0.0001

R-squared	0.999684	Mean dependent var	4.010504
Adjusted R-squared	0.999368	S.D. dependent var	0.913413
S.E. of regression	0.022955	Akaike info criterion	-4.404109
Sum squared resid	0.008958	Schwarz criterion	-3.604216
Log likelihood	95.07191	Hannan-Quinn criter.	-4.127986
F-statistic	3165.673	Durbin-Watson stat	2.865922
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model

selection.

TABLE 4.3.1: Short Run Output.

ARDL Cointegrating And Long Run Form
Dependent Variable: LNRGDP
Selected Model: ARDL(2, 3, 1, 4, 3)
Date: 06/24/22 Time: 13:08
Sample: 1981 2020
Included observations: 35

Cointegrating Form: **SHORT RUN**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNRGDP(-1))	0.811779	0.173759	4.671860	0.0002
D(LNINFLR(-1))	0.081145	0.033430	2.427327	0.0266
D(LNINFLR(-2))	-0.024323	0.031413	-0.774297	0.4494
D(LNINFLR(-3))	-0.064833	0.031688	-2.045951	0.0566
D(LNGOREV(-1))	-0.207132	0.058683	-3.529661	0.0026
D(LNGOEXP(-1))	0.245955	0.073010	3.368768	0.0036
D(LNGOEXP(-2))	-0.040664	0.082976	-0.490069	0.6303
D(LNGOEXP(-3))	0.140933	0.074633	1.888337	0.0762
D(LNGOEXP(-4))	-0.198791	0.063057	-3.152551	0.0058
D(LNUNEMP(-1))	-0.028244	0.042306	-0.667626	0.5133
D(LNUNEMP(-2))	0.050560	0.045372	1.114335	0.2806
D(LNUNEMP(-3))	-0.123380	0.036870	-3.346379	0.0038
CointEq(-1)	-0.516640	0.089660	-5.762206	0.0000

Cointeq = LNRGDP - (0.2643*LNINFLR(-1) -0.1989*LNGOREV(-1) +
1.1838*LNGOEXP(-1) + 0.1795*LNUNEMP(-1) + 0.8896)

Table 4.3.2: Long Run Output.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNINFLR(-1)	0.264337	0.122805	2.152498	0.0460
LNGOREV(-1)	-0.198909	0.072858	-2.730095	0.0142
LNGOEXP(-1)	1.183781	0.077140	15.345915	0.0000
LNUNEMP(-1)	0.179523	0.058759	3.055273	0.0072
C	0.889617	0.130355	6.824562	0.0000

Source: E-views 9 Regression output.

Short Run Analysis:

D(LNGOREV(-1)): has a negative and significant relationship with LNRGDP in the short run at 5% level of significance.

D(LNGOEXP(-1)): has a positive and significant relationship with LNRGDP in the short run at 5% level of significance.

D(LNUNEMRATE(-1)): has negative and insignificant relationship with LNRGDP in the short run at 5% level of significance.

D(LNINFLR(-1)): has a positive and significant relationship with LNRGDP in the short run at 5% level of significance.

The ECM coefficient was negative and significant at the 5% level of significance; hence, any short run dis-equilibrium in the model will be corrected at the rate of 51.6% per annum and this approximately 2 years.

Long Run Analysis:

LNGOREV: has a negative and significant relationship with LNRGDP at 5% level of significance. Hence; LNGOREV has a significant impact on economic growth of Nigeria in the long run.

LNGOEXP: has a positive and significant relationship with LNRGDP at 5% level of significance. Hence, LNGOEXP has a significant impact on economic growth of Nigeria in the long run.

LNUNEMRATE: has a positive and significant relationship with LNRGDP at 5% level of significance. Hence; LNUNEMRATE has a significant impact on economic growth of Nigeria in the long run.

LNINFLR: has a positive and significant relationship with RGDP at 5% level of significance. Hence; LNINFLR has a significant impact on economic growth of Nigeria in the long run.

4.4 Test Of Significance.

4.4. 1 Individual Test Of Significance.

i. Test Of Significance Of GOREV.

H_0: GOREV has no significant relationship with economic growth of Nigeria at α=0.05
H_1: GOREV has a significant relationship with economic growth of Nigeria at α=0.05
Prob.value = 0.0142, α = 0.05

Decision: Since the prob.value (0.0142) < 0.05 the null hypothesis is rejected and it is concluded that GOREV has a significant relationship with economic growth of Nigeria at α = 0.05.

ii. Test Of Significance Of GOEXP.

H_0: GOEXP has no significant relationship with economic growth of Nigeria at α=0.05
H_1: GOEXP has a significant relationship with economic growth of Nigeria at α=0.05
Prob.value = 0.0000, α = 0.05

Decision: Since the prob.value (0.0000) < 0.05 the null hypothesis is rejected and it is concluded that GOEXP has a significant relationship with economic growth of Nigeria at α=0.05

iii. Test Of Significance Of UNEMRATE.

H_0: UNEMRATE has no significant relationship with economic growth of Nigeria at α=0.05

H_1: UNEMRATE has a significant relationship with economic growth of Nigeria at α=0.05

Prob.value = 0.0072, α = 0.05

Decision: Since the prob.value (0.0072) < 0.05 the null hypothesis is rejected and it is concluded that UNEMRATE has a significant relationship with economic growth of Nigeria at α=0.05.

ii. Test Of Significance Of INFLR.

H_0: INFLR has no significant relationship with economic growth of Nigeria at α=0.05

H_1: INFLR has a significant relationship with economic growth of Nigeria at α=0.05

Prob.value = 0.0460, α = 0.05

Decision: Since the prob.value (0.0460) < 0.05 the null hypothesis is rejected and it is concluded that INFLR has a significant relationship with economic growth of Nigeria at α=0.05.

4.4.2 Joint Test Of Significance (Anova).

Ho: GOREV=GOEXP=UNEMRATE=INFLR=0

H_1: GOREV≠GOEXP≠UNEMRATE≠INFLR≠0

Decision: From the regression result, the F-prob. value is 0.000000 which is less than 0.05; hence we reject the null hypothesis and conclude that there is a joint impact of GOREV, GOEXP, UNEMRATE, and INFLR on economic growth (RGDP) of Nigeria at 5% level of significance.

4.5 Post Estimation Tests

4.5.1 Variance Inflation Factor Test For Multicollinearity.

H_0: There is no presence of multicollinearity in the model at α = 0.05.

H_1: There is presence of multicollinearity in the model at α = 0.05.

R^2 =0.999368, $\quad VIF = \frac{1}{1-R^2} > 10$

Decision: Since VIF > 10, and the condition for presence of multicollinearity states that VIF should exceed 5; hence the null hypothesis is rejected and it is concluded that there is presence of multicollinearity in the model at 5% level of significance. However, since it did not affect our model in any significant way, we shall ignore it (take no action) as it is a matter of degree and not kind (see Egbulonu, 2005).

4.5.2 Test For Serial Correlation.

H_0: There is no serial autocorrelation in the model at α = 0.05.

H_1: There is presence of serial autocorrelation in the model at α = 0.05.

Decision: The Durbin Watson (DW) = 2.865922 tends to 2; hence there is no evidence of serial correlation in the model.

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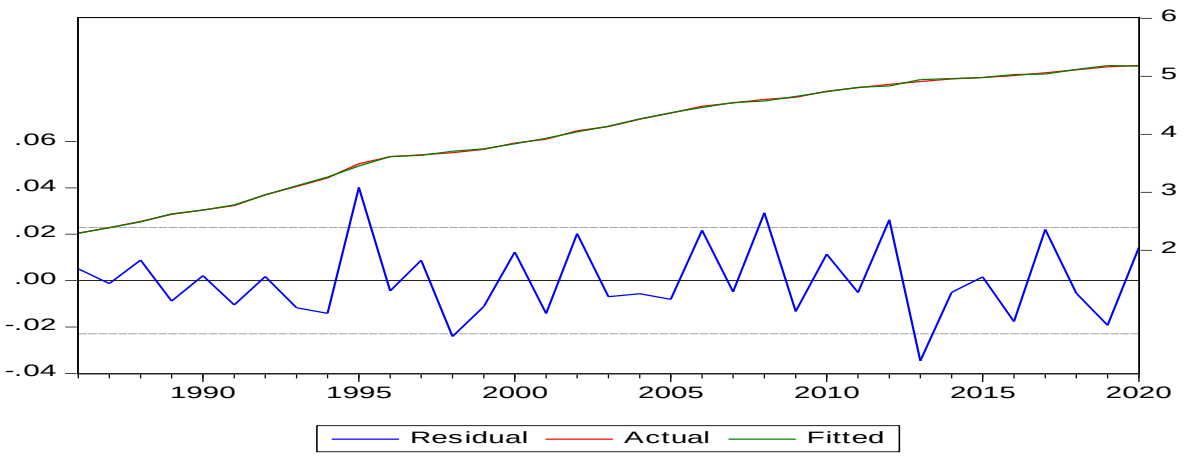


Furthermore, the residual graph plot shows that the actual and fitted lines show almost zero deviation; hence, a good fit and confirms the absence of autocorrelation in the model.

4.5.3 Breusch-Pagan-Godfrey Test For Heteroscedasticity.

H_0: There is no heteroscedasticity in the model at α = 0.05.

H_1: There is presence of heteroscedasticity in the model at $\alpha = 0.05$.

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.514592	Prob. F(17,17)	0.9095
Obs*R-squared	11.89147	Prob. Chi-Square(17)	0.8067
Scaled explained SS	2.703160	Prob. Chi-Square(17)	1.0000

Decision: Since Prob. Chi-square (5) is greater than 0.05, it means that there is no heteroscedasticity in the model.

4.5.4 Test For Causality

H_o: There is no causality between macro-economic aggregates and growth of the Nigerian economy at $\alpha = 0.05$.

H_1: There is a causality between macro-economic aggregates and growth of the Nigerian economy at $\alpha = 0.05$.

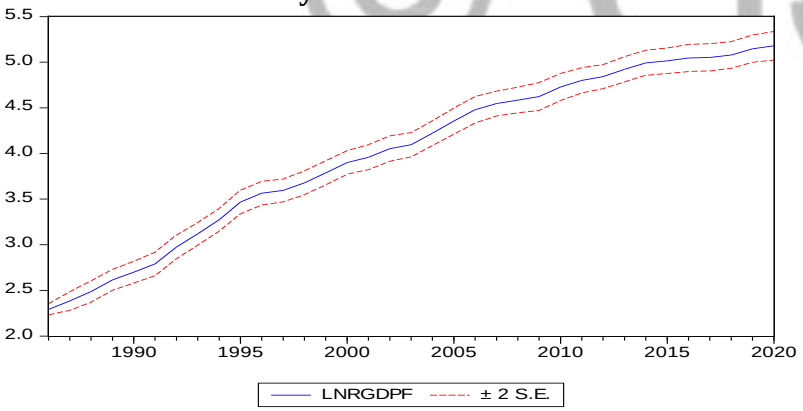
Decision: From the Granger causality test result, it was seen that causality exists and flowed uni-directionally from LNRGDP $\rightarrow$ LNGOREV and LNGOEXP $\rightarrow$ LNRGDP respectively. This answers the research questions formulated in section one and shows that there is uni-directional causality between macro-economic aggregates and economic growth of Nigeria (See appendix).

4.5.5 Goodness Of Fit Of The Model.

Adj.R^2 = 0.999368 x 100% = 99.9%

From the result of the regression, the Adjusted R-squared shows that about 99.9% variation in economic growth can be explained by the explanatory variables; hence, the model has a very strong explanatory power in relation to economic growth of Nigeria.

4.5.6 Forecast Analysis.



Forecast: LNRGDPF	
Actual: LNRGDP	
Forecast sample: 1981 2020	
Adjusted sample: 1986 2020	
Included observations: 35	
Root Mean Squared Error	0.026038
Mean Absolute Error	0.021062
Mean Abs. Percent Error	0.533192
Theil Inequality Coefficient	0.003168
Bias Proportion	0.000343
Variance Proportion	0.001505
Covariance Proportion	0.998151

From the forecast above, it can be seen that the forecast is not biased. The bias proportion is very minimal i.e. 0.000343 and has a very small variance proportion of 0.001505. This means that most of the forecast errors are rightly attributable to the covariance proportion component which is 0.998151.i.e. 99.8%.

The Theil inequality coefficient is a measure of the accuracy of a set of predictions generated from some sample model and is shown above to be 0.003168.i.e. 0.3% and it is closer to zero; hence; shows that the time series are not significantly different from another.; hence, validating the forecast.

4.7 Discussion of Findings.

Some important findings from the study were discussed below:

i. **GOREV**: was found to be negatively related and significant in the long run; hence, meaning that it has a negative impact on the economy in the long run. The coefficient sign was inconsistent with our *a priori* expectation. The above is as a result of the fact that despite huge revenue inflows accruable to the economy, it has not yielded much level of economic growth desired due to misappropriation and heightened prevalence of corruption. It is no longer news that a lot has been done to improve revenue sourcing and leakages, but policy inconsistency, misdirection and bad governance has not helped in utilizing the bulk of revenue into capital projects that could increase the level of investment and employment in the economy.

ii. **GOEXP:** was found to be positively related and significant in the long run; hence, meaning that it has a positive impact on the economy in the long run. The coefficient sign was consistent with our *a priori* expectation. The above is as a result of the fact that Keynesian theorizing still holds true till date; meaning that to propel the economy requires a serious push from the government through its interventionist role if it plans to reduce inflation and increase domestic investment and increase employment ceteris paribus. This means that government expenditure is a great stimulus to economic growth.

iii. UNEMRATE: was found to be positively related and significant in the long run; hence, meaning that it has a positive impact on the economy in the long run. The coefficient sign was inconsistent with our *a priori* expectation. This corroborates the findings of Akeju and Olanipekun (2014) on unemployment and economic growth of Nigeria. The above is as a result of the fact that unemployment rate determines how much of idle capacity and factors can and have been employed in producing output; sadly, there has been high and fast rising; implying that the level of growth of the economy will be on the low if the employable factors are not absorbed by the economy in terms of paid employment and overall production of goods and services. The rising level of unemployment rate in the economy is primarily as a result of the malfunctional productive system, government policy effects on business cycles, corruption, ineffective educational system and insincere administration. All these factors have reduced the MEC of available capital in no small way and hence; affected the economy.

iv. INFLR: was found to be positively related and significant in the long run; hence, meaning that it has a positive impact on the economy in the long run. The coefficient sign was inconsistent with our *a priori* expectation. This corroborates the findings of Thayaparan (2014) who examined the impact of inflation and economic growth on unemployment. The above is as a result of the fact that an increase in inflation rate ceteris paribus affects the rate of investment and productive capabilities in the economy. In Nigeria the rate of inflation has been on the increase and it has greatly affected the economy in general prices of consumer and capital goods. It has affected the level of investment and ability of producers to keep up with production; hence in the long run, inflation rate can keep the economy in a stasis mode if unchecked because it affects other aggregates such as employment, investment, level of spending etc

From the discussion above, it can be seen that the growth of the Nigerian economy can be explained by the contributions from economic aggregates of government revenue, government expenditure, unemployment rate and inflation rate combined. The careful tinkering of these aggregates ill shape the projection of economic growth. The significance of some of the variables examined in the short run and long run attest to this fact. The overall goodness of fit of the model was ascertained through the adjusted R-squared which showed a 99.9% explanatory power and a very good fit of the model. The model forecast was also found to be stable.

SECTION FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

From the hypotheses tested it was discovered that:

-GOREV, GOEXP and INFLR were statistically insignificant in the short run, with the exception of UNEMRATE.

-GOREV, GOEXP, UNEMRATE; and INFLR were statistically significant in the long run at 5% level of significance.

- GOREV, GOEXP, UNEMRATE; and INFLR had a statistically significant joint impact on economic growth of Nigeria at 5% level of significance.

-The result of the granger causality test showed that causality flowed uni-directionally from RGDP $\rightarrow$ GOREV and GOEXP $\rightarrow$ RGDP respectively.

-The model showed a good fit of variables as seen from the adjusted R-squared of 99.9 %% with no significant effect of violations of econometric assumptions. The forecast was in line when examined from the bias proportion, variance and covariance proportion and Theil coefficients respectively.

5.2 Conclusion

From the study it was found that ATM, MOBPAY, NIP, POS; and TRADE were statistically significant at 5% level of significance in the long run. The causality test showed a unidirectional causality existed. The joint test result showed that all the explanatory variables had a joint impact on economic growth. The adjusted R-squared of 99.9 % showed a very good fit of the model. It is therefore concluded that E-banking and Trade have an impact on economic growth of the Nigerian economy.

5.3 Recommendations

This study made the following recommendations:

- **i.** The study found GOREV and GOEXP significantly related and impactful on the growth of the Nigerian economy; it is therefore recommended that these channels be regulated to avoid gyrations in the long run.
- **ii.** The study found out that UNEMRATE and INFLR were significantly related to economic growth on a positive note; hence, the forces that prompt its negative effect from occurring should be mitigated to play greater role in the economy in the long run.

5.4 Suggestions for Further Studies.

i. A VAR analysis will be adequate to capture the interaction between the variables when they are all transformed exogenously to become endogenous at some point. This will show greater interaction among the variables and their causality effects.

ii. An expansion of the trade variables and the use of Dynamic least squares might produce more interesting results.

5.5 Contribution to Knowledge

The work has contributed to knowledge by expanding the variables of previous studies by introducing important defining payment variables such as UNEMRATE and INFLR as explanatory variables; while Real Gross Domestic Product was used as the dependent variable. Furthermore, the study enlarged the time scope of study to a more recent period.

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APPENDIX

VAR Lag Order Selection Criteria
Endogenous variables: LNRGDP LNINFLR LNGOREV LNGOEXP LNUNEMP
Exogenous variables: C
Date: 06/24/22 Time: 12:57
Sample: 1981 2020
Included observations: 37

Lag	LogL	LR	FPE	AIC	SC	HQ
0	11.04488	NA	4.96e-07	-0.326750	-0.109059	-0.250004
1	189.0725	298.3166	1.29e-10	-8.598515	-7.292365*	-8.138036*
2	217.1048	39.39667*	1.18e-10*	-8.762420*	-6.367812	-7.918208
3	233.6748	18.80920	2.30e-10	-8.306745	-4.823679	-7.078801

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Null Hypothesis: LNRGDP has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.407737	0.5684
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(LNRGDP)
Method: Least Squares
Date: 06/24/22 Time: 12:58
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNRGDP(-1)	-0.009834	0.006986	-1.407737	0.1680
D(LNRGDP(-1))	0.499161	0.141625	3.524532	0.0012
C	0.076956	0.030895	2.490869	0.0176

R-squared	0.313642	Mean dependent var	0.079339
Adjusted R-squared	0.274421	S.D. dependent var	0.050122
S.E. of regression	0.042694	Akaike info criterion	-3.393838
Sum squared resid	0.063799	Schwarz criterion	-3.264555
Log likelihood	67.48292	Hannan-Quinn criter.	-3.347840
F-statistic	7.996886	Durbin-Watson stat	2.171916
Prob(F-statistic)	0.001379		

Null Hypothesis: D(LNRGDP) has a unit root

Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.334893	0.0201
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(LNRGDP,2)
Method: Least Squares
Date: 06/24/22 Time: 12:58
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNRGDP(-1))	-0.474506	0.142285	-3.334893	0.0020
C	0.037586	0.013307	2.824464	0.0077

R-squared	0.236018	Mean dependent var	-0.000116
Adjusted R-squared	0.214796	S.D. dependent var	0.048834
S.E. of regression	0.043273	Akaike info criterion	-3.391394
Sum squared resid	0.067411	Schwarz criterion	-3.305205
Log likelihood	66.43648	Hannan-Quinn criter.	-3.360729
F-statistic	11.12151	Durbin-Watson stat	2.132799
Prob(F-statistic)	0.001988		

Null Hypothesis: LNUNEMP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.183801	0.6718
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(LNUNEMP)
Method: Least Squares
Date: 06/24/22 Time: 12:59
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNUNEMP(-1)	-0.093785	0.079223	-1.183801	0.2440
C	0.096473	0.074206	1.300079	0.2016

R-squared	0.036493	Mean dependent var	0.013877
Adjusted R-squared	0.010452	S.D. dependent var	0.158610
S.E. of regression	0.157779	Akaike info criterion	-0.805320
Sum squared resid	0.921088	Schwarz criterion	-0.720009
Log likelihood	17.70373	Hannan-Quinn criter.	-0.774711

F-statistic	1.401384	Durbin-Watson stat	1.908991
Prob(F-statistic)	0.244042		

Null Hypothesis: D(LNUNEMP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.063804	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(LNUNEMP,2)
Method: Least Squares
Date: 06/24/22 Time: 12:59
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNUNEMP(-1))	-1.014557	0.167314	-6.063804	0.0000
C	0.014949	0.026485	0.564422	0.5760

R-squared	0.505289	Mean dependent var	0.003340
Adjusted R-squared	0.491547	S.D. dependent var	0.228363
S.E. of regression	0.162836	Akaike info criterion	-0.740951
Sum squared resid	0.954560	Schwarz criterion	-0.654762
Log likelihood	16.07807	Hannan-Quinn criter.	-0.710286
F-statistic	36.76971	Durbin-Watson stat	1.935399
Prob(F-statistic)	0.000001		

Null Hypothesis: LNINFLR has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.132959	0.0001
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(LNINFLR)
Method: Least Squares
Date: 06/24/22 Time: 12:59
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNINFLR(-1)	-0.992207	0.193301	-5.132959	0.0000
D(LNINFLR(-1))	0.302826	0.150640	2.010263	0.0522

C	1.079978	0.210989	5.118650	0.0000

R-squared	0.449833	Mean dependent var	0.006991
Adjusted R-squared	0.418395	S.D. dependent var	0.215981
S.E. of regression	0.164714	Akaike info criterion	-0.693561
Sum squared resid	0.949569	Schwarz criterion	-0.564278
Log likelihood	16.17766	Hannan-Quinn criter.	-0.647563
F-statistic	14.30855	Durbin-Watson stat	1.618258
Prob(F-statistic)	0.000029		

Null Hypothesis: D(LNINFLR) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.502894	0.0000
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(LNINFLR,2)
Method: Least Squares
Date: 06/24/22 Time: 13:00
Sample (adjusted): 1984 2020
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNINFLR(-1))	-1.605466	0.213980	-7.502894	0.0000
D(LNINFLR(-1),2)	0.441167	0.135044	3.266828	0.0025
C	-0.005485	0.030292	-0.181077	0.8574

R-squared	0.671984	Mean dependent var	-0.010395
Adjusted R-squared	0.652688	S.D. dependent var	0.312541
S.E. of regression	0.184190	Akaike info criterion	-0.468091
Sum squared resid	1.153485	Schwarz criterion	-0.337476
Log likelihood	11.65969	Hannan-Quinn criter.	-0.422043
F-statistic	34.82667	Durbin-Watson stat	1.995718
Prob(F-statistic)	0.000000		

Null Hypothesis: LNGOREV has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.427700	0.5589
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(LNGOREV)
Method: Least Squares
Date: 06/24/22 Time: 13:00
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGOREV(-1)	-0.030212	0.021161	-1.427700	0.1618
C	0.158798	0.064197	2.473606	0.0181

R-squared	0.052213	Mean dependent var	0.072943
Adjusted R-squared	0.026598	S.D. dependent var	0.142246
S.E. of regression	0.140342	Akaike info criterion	-1.039554
Sum squared resid	0.728743	Schwarz criterion	-0.954244
Log likelihood	22.27131	Hannan-Quinn criter.	-1.008946
F-statistic	2.038326	Durbin-Watson stat	2.074103
Prob(F-statistic)	0.161765		

Null Hypothesis: D(LNGOREV) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.243867	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(LNGOREV,2)
Method: Least Squares
Date: 06/24/22 Time: 13:00
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGOREV(-1))	-1.035578	0.165855	-6.243867	0.0000
C	0.079328	0.026561	2.986613	0.0051

R-squared	0.519910	Mean dependent var	0.000640
Adjusted R-squared	0.506574	S.D. dependent var	0.205185
S.E. of regression	0.144130	Akaike info criterion	-0.985000
Sum squared resid	0.747849	Schwarz criterion	-0.898811
Log likelihood	20.71499	Hannan-Quinn criter.	-0.954334
F-statistic	38.98587	Durbin-Watson stat	2.011574
Prob(F-statistic)	0.000000		

Null Hypothesis: LNGOEXP has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.708734	0.4189
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(LNGOEXP)
Method: Least Squares
Date: 06/24/22 Time: 13:01
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGOEXP(-1)	-0.027092	0.015855	-1.708734	0.0964
D(LNGOEXP(-1))	-0.192037	0.160851	-1.193880	0.2406
C	0.161802	0.048183	3.358085	0.0019

R-squared	0.100282	Mean dependent var	0.074581
Adjusted R-squared	0.048869	S.D. dependent var	0.095013
S.E. of regression	0.092662	Akaike info criterion	-1.844056
Sum squared resid	0.300520	Schwarz criterion	-1.714773
Log likelihood	38.03707	Hannan-Quinn criter.	-1.798058
F-statistic	1.950530	Durbin-Watson stat	1.937020
Prob(F-statistic)	0.157350		

Null Hypothesis: D(LNGOEXP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.069350	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(LNGOEXP,2)
Method: Least Squares
Date: 06/24/22 Time: 13:01
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGOEXP(-1))	-1.158122	0.163823	-7.069350	0.0000
C	0.086183	0.019557	4.406764	0.0001

R-squared	0.581277	Mean dependent var	0.001213
Adjusted R-squared	0.569646	S.D. dependent var	0.144968

S.E. of regression	0.095101	Akaike info criterion	-1.816563
Sum squared resid	0.325590	Schwarz criterion	-1.730374
Log likelihood	36.51470	Hannan-Quinn criter.	-1.785898
F-statistic	49.97571	Durbin-Watson stat	1.916456
Prob(F-statistic)	0.000000		

DESCRIPTIVES

	LNRGDP	LNINFLR(-1)	LNGOREV(-1)	LNGOEXP(-1)	LNUNEMP(-1)
Mean	3.826542	1.085666	2.841738	2.657235	0.880703
Median	3.915637	1.113943	3.238498	2.976671	0.892095
Maximum	5.188232	1.359835	4.045980	3.939105	1.378398
Minimum	2.173332	0.663701	1.021189	0.982271	0.255273
Std. Dev.	1.024964	0.180999	1.075847	0.990912	0.323076
Skewness	-0.290786	-0.599834	-0.491218	-0.418428	-0.214109
Kurtosis	1.671803	2.457364	1.754814	1.759514	1.807751
Jarque-Bera	3.416291	2.817195	4.087964	3.638595	2.607843
Probability	0.181202	0.244486	0.129512	0.162140	0.271465
Sum	149.2352	42.34099	110.8278	103.6322	34.34743
Sum Sq. Dev.	39.92092	1.244900	43.98301	37.31246	3.966357
Observations	39	39	39	39	39

DEPENDENT VARIABLE: LNRGDP
Method: ARDL
Date: 06/24/22 Time: 13:07
Sample (adjusted): 1986 2020
Included observations: 35 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LNINFLR(-1) LNGOREV(-1)
LNGOEXP(-1) LNUNEMP(-1)
Fixed regressors: C
Number of models evalulated: 1250
Selected Model: ARDL(2, 3, 1, 4, 3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNRGDP(-1)	1.295139	0.170773	7.583970	0.0000
LNRGDP(-2)	-0.811779	0.173759	-4.671860	0.0002
LNINFLR(-1)	0.081145	0.033430	2.427327	0.0266
LNINFLR(-2)	-0.033734	0.037800	-0.892452	0.3846
LNINFLR(-3)	0.024323	0.031413	0.774297	0.4494
LNINFLR(-4)	0.064833	0.031688	2.045951	0.0566
LNGOREV(-1)	-0.207132	0.058683	-3.529661	0.0026
LNGOREV(-2)	0.104368	0.041051	2.542380	0.0210
LNGOEXP(-1)	0.245955	0.073010	3.368768	0.0036
LNGOEXP(-2)	0.267111	0.075150	3.554358	0.0024
LNGOEXP(-3)	0.040664	0.082976	0.490069	0.6303
LNGOEXP(-4)	-0.140933	0.074633	-1.888337	0.0762
LNGOEXP(-5)	0.198791	0.063057	3.152551	0.0058
LNUNEMP(-1)	-0.028244	0.042306	-0.667626	0.5133
LNUNEMP(-2)	0.048173	0.052151	0.923731	0.3686
LNUNEMP(-3)	-0.050560	0.045372	-1.114335	0.2806
LNUNEMP(-4)	0.123380	0.036870	3.346379	0.0038

C	0.459612	0.094051	4.886835	0.0001

R-squared	0.999684	Mean dependent var	4.010504
Adjusted R-squared	0.999368	S.D. dependent var	0.913413
S.E. of regression	0.022955	Akaike info criterion	-4.404109
Sum squared resid	0.008958	Schwarz criterion	-3.604216
Log likelihood	95.07191	Hannan-Quinn criter.	-4.127986
F-statistic	3165.673	Durbin-Watson stat	2.865922
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

ARDL BOUNDS TEST
Date: 06/24/22 Time: 13:07
Sample: 1986 2020
Included observations: 35
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	7.038540	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Test Equation:
Dependent Variable: D(LNRGDP)
Method: Least Squares
Date: 06/24/22 Time: 13:07
Sample: 1986 2020
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNRGDP(-1))	0.811779	0.173759	4.671860	0.0002
D(LNINFLR(-1))	0.081145	0.033430	2.427327	0.0266
D(LNINFLR(-2))	-0.089156	0.039958	-2.231263	0.0394
D(LNINFLR(-3))	-0.064833	0.031688	-2.045951	0.0566
D(LNGOREV(-1))	-0.207132	0.058683	-3.529661	0.0026
D(LNGOEXP(-1))	0.245955	0.073010	3.368768	0.0036
D(LNGOEXP(-2))	-0.098522	0.086639	-1.137156	0.2712
D(LNGOEXP(-3))	-0.057858	0.076605	-0.755286	0.4604
D(LNGOEXP(-4))	-0.198791	0.063057	-3.152551	0.0058
D(LNUNEMP(-1))	-0.028244	0.042306	-0.667626	0.5133
D(LNUNEMP(-2))	-0.072820	0.036981	-1.969126	0.0655
D(LNUNEMP(-3))	-0.123380	0.036870	-3.346379	0.0038
C	0.459612	0.094051	4.886835	0.0001
LNINFLR(-2)	0.136567	0.070066	1.949114	0.0680
LNGOREV(-2)	-0.102764	0.042851	-2.398193	0.0282
LNGOEXP(-2)	0.611589	0.116832	5.234788	0.0001
LNUNEMP(-2)	0.092749	0.034740	2.669826	0.0162
LNRGDP(-1)	-0.516640	0.089660	-5.762206	0.0000

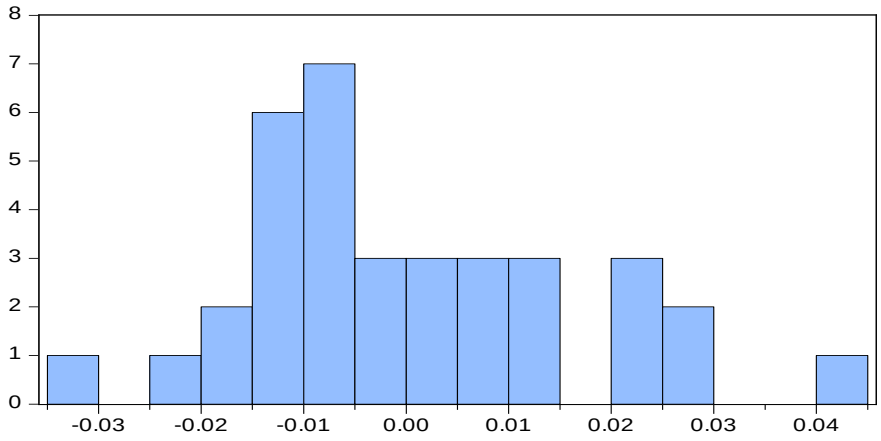
R-squared	0.895144	Mean dependent var	0.083270
Adjusted R-squared	0.790289	S.D. dependent var	0.050127
S.E. of regression	0.022955	Akaike info criterion	-4.404109

Sum squared resid	0.008958	Schwarz criterion	-3.604216
Log likelihood	95.07191	Hannan-Quinn criter.	-4.127986
F-statistic	8.536924	Durbin-Watson stat	2.865922
Prob(F-statistic)	0.000028		

PAIRWISE GRANGER CAUSALITY TESTS
Date: 06/24/22 Time: 13:03
Sample: 1981 2020
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LNINFLR(-1) does not Granger Cause LNRGDP	37	1.03077	0.3683
LNRGDP does not Granger Cause LNINFLR(-1)		1.25417	0.2990
LNGOREV(-1) does not Granger Cause LNRGDP	37	2.22561	0.1245
LNRGDP does not Granger Cause LNGOREV(-1)		7.84521	0.0017
LNGOEXP(-1) does not Granger Cause LNRGDP	37	4.65907	0.0168
LNRGDP does not Granger Cause LNGOEXP(-1)		1.77015	0.1866
LNUNEMP(-1) does not Granger Cause LNRGDP	37	0.34556	0.7104
LNRGDP does not Granger Cause LNUNEMP(-1)		2.32920	0.1137
LNGOREV(-1) does not Granger Cause LNINFLR(-1)	37	0.06424	0.9379
LNINFLR(-1) does not Granger Cause LNGOREV(-1)		0.22557	0.7993
LNGOEXP(-1) does not Granger Cause LNINFLR(-1)	37	0.21956	0.8041
LNINFLR(-1) does not Granger Cause LNGOEXP(-1)		0.86502	0.4307
LNUNEMP(-1) does not Granger Cause LNINFLR(-1)	37	0.12290	0.8848
LNINFLR(-1) does not Granger Cause LNUNEMP(-1)		1.31296	0.2831
LNGOEXP(-1) does not Granger Cause LNGOREV(-1)	37	2.09125	0.1401
LNGOREV(-1) does not Granger Cause LNGOEXP(-1)		0.39400	0.6776
LNUNEMP(-1) does not Granger Cause LNGOREV(-1)	37	0.28194	0.7562
LNGOREV(-1) does not Granger Cause LNUNEMP(-1)		1.93637	0.1608
LNUNEMP(-1) does not Granger Cause LNGOEXP(-1)	37	3.24122	0.0523
LNGOEXP(-1) does not Granger Cause LNUNEMP(-1)		2.42522	0.1045

HISTOGRAM/NORMALITY TEST



Series: Residuals	
Sample 1986 2020	
Observations 35	
Mean	-2.01e-15
Median	-0.004787
Maximum	0.040218
Minimum	-0.034562
Std. Dev.	0.016232
Skewness	0.437806
Kurtosis	2.927101
Jarque-Bera	1.125849
Probability	0.569541

ARDL COINTEGRATING AND LONG RUN FORM

Dependent Variable: LNRGDP
Selected Model: ARDL(2, 3, 1, 4, 3)
Date: 06/24/22 Time: 13:08
Sample: 1981 2020
Included observations: 35

COINTEGRATING FORM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNRGDP(-1))	0.811779	0.173759	4.671860	0.0002
D(LNINFLR(-1))	0.081145	0.033430	2.427327	0.0266
D(LNINFLR(-2))	-0.024323	0.031413	-0.774297	0.4494
D(LNINFLR(-3))	-0.064833	0.031688	-2.045951	0.0566
D(LNGOREV(-1))	-0.207132	0.058683	-3.529661	0.0026
D(LNGOEXP(-1))	0.245955	0.073010	3.368768	0.0036
D(LNGOEXP(-2))	-0.040664	0.082976	-0.490069	0.6303
D(LNGOEXP(-3))	0.140933	0.074633	1.888337	0.0762
D(LNGOEXP(-4))	-0.198791	0.063057	-3.152551	0.0058
D(LNUNEMP(-1))	-0.028244	0.042306	-0.667626	0.5133
D(LNUNEMP(-2))	0.050560	0.045372	1.114335	0.2806
D(LNUNEMP(-3))	-0.123380	0.036870	-3.346379	0.0038
CointEq(-1)	-0.516640	0.089660	-5.762206	0.0000

Cointeq = LNRGDP - (0.2643*LNINFLR(-1) -0.1989*LNGOREV(-1) +
1.1838*LNGOEXP(-1) + 0.1795*LNUNEMP(-1) + 0.8896)

LONG RUN COEFFICIENTS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNINFLR(-1)	0.264337	0.122805	2.152498	0.0460
LNGOREV(-1)	-0.198909	0.072858	-2.730095	0.0142
LNGOEXP(-1)	1.183781	0.077140	15.345915	0.0000
LNUNEMP(-1)	0.179523	0.058759	3.055273	0.0072
C	0.889617	0.130355	6.824562	0.0000

HETEROSKEDASTICITY TEST: BREUSCH-PAGAN-GODFREY

F-statistic	0.514592	Prob. F(17,17)	0.9095
Obs*R-squared	11.89147	Prob. Chi-Square(17)	0.8067

Scaled explained SS	2.703160	Prob. Chi-Square(17)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/24/22 Time: 13:14
Sample: 1986 2020
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000490	0.001697	-0.288986	0.7761
LNRGDP(-1)	0.001219	0.003082	0.395467	0.6974
LNRGDP(-2)	-0.001170	0.003136	-0.373138	0.7137
LNINFLR(-1)	0.000102	0.000603	0.169048	0.8678
LNINFLR(-2)	-0.000136	0.000682	-0.198857	0.8447
LNINFLR(-3)	0.000187	0.000567	0.329634	0.7457
LNINFLR(-4)	5.57E-05	0.000572	0.097368	0.9236
LNGOREV(-1)	-0.000114	0.001059	-0.107582	0.9156
LNGOREV(-2)	0.000353	0.000741	0.476825	0.6396
LNGOEXP(-1)	-0.000736	0.001318	-0.558907	0.5835
LNGOEXP(-2)	0.002355	0.001356	1.736888	0.1005
LNGOEXP(-3)	-0.001331	0.001497	-0.888603	0.3866
LNGOEXP(-4)	-0.001234	0.001347	-0.916226	0.3724
LNGOEXP(-5)	0.000814	0.001138	0.715196	0.4842
LNUNEMP(-1)	-0.000608	0.000763	-0.796431	0.4368
LNUNEMP(-2)	0.001063	0.000941	1.129187	0.2745
LNUNEMP(-3)	-0.000984	0.000819	-1.201554	0.2460
LNUNEMP(-4)	0.000347	0.000665	0.521505	0.6087

R-squared	0.339756	Mean dependent var	0.000256
Adjusted R-squared	-0.320487	S.D. dependent var	0.000360
S.E. of regression	0.000414	Akaike info criterion	-12.43380
Sum squared resid	2.92E-06	Schwarz criterion	-11.63390
Log likelihood	235.5914	Hannan-Quinn criter.	-12.15767
F-statistic	0.514592	Durbin-Watson stat	2.282736
Prob(F-statistic)	0.909510		

RAMSEY RESET TEST
Equation: UNTITLED
Specification: LNRGDP LNRGDP(-1) LNRGDP(-2) LNINFLR(-1) LNINFLR(-2) LNINFLR(-3) LNINFLR(-4) LNGOREV(-1) LNGOREV(-2) LNGOEXP(-1) LNGOEXP(-2) LNGOEXP(-3) LNGOEXP(-4) LNGOEXP(-5) LNUNEMP(-1) LNUNEMP(-2) LNUNEMP(-3) LNUNEMP(-4) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.669103	16	0.5130
F-statistic	0.447698	(1, 16)	0.5130

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.000244	1	0.000244
Restricted SSR	0.008958	17	0.000527
Unrestricted SSR	0.008714	16	0.000545

Unrestricted Test Equation:
Dependent Variable: LNRGDP
Method: ARDL
Date: 06/24/22 Time: 13:14
Sample: 1986 2020
Included observations: 35

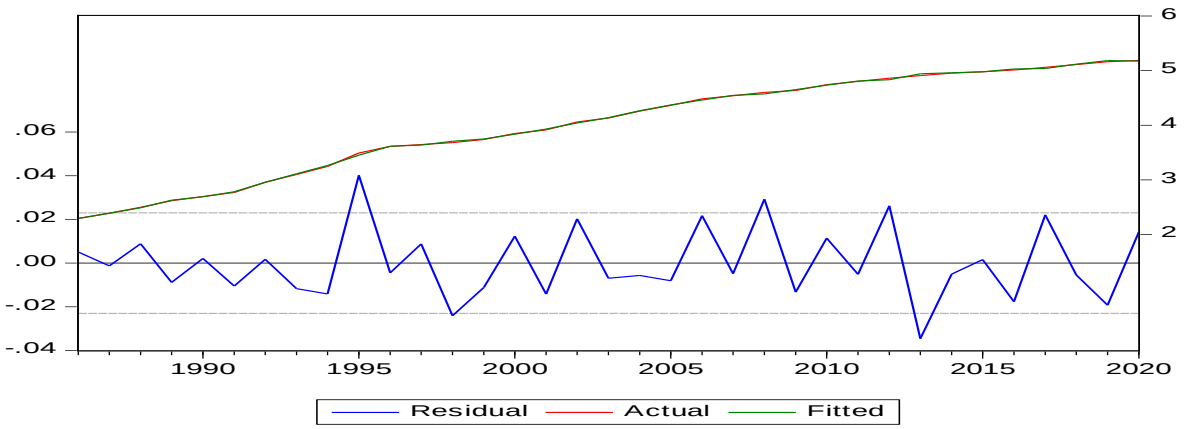
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic):
Fixed regressors: C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNRGDP(-1)	1.442891	0.280900	5.136678	0.0001
LNRGDP(-2)	-0.868641	0.196031	-4.431145	0.0004
LNINFLR(-1)	0.087843	0.035430	2.479339	0.0247
LNINFLR(-2)	-0.038465	0.039074	-0.984420	0.3396
LNINFLR(-3)	0.027053	0.032196	0.840271	0.4131
LNINFLR(-4)	0.073965	0.034988	2.114022	0.0506
LNGOREV(-1)	-0.248212	0.085609	-2.899379	0.0105
LNGOREV(-2)	0.096822	0.043232	2.239598	0.0397
LNGOEXP(-1)	0.261227	0.077656	3.363899	0.0039
LNGOEXP(-2)	0.301834	0.092360	3.268024	0.0048
LNGOEXP(-3)	0.040600	0.084358	0.481287	0.6368
LNGOEXP(-4)	-0.145878	0.076235	-1.913530	0.0737
LNGOEXP(-5)	0.209285	0.065998	3.171092	0.0059
LNUNEMP(-1)	-0.027349	0.043031	-0.635553	0.5341
LNUNEMP(-2)	0.065881	0.059257	1.111780	0.2827
LNUNEMP(-3)	-0.062463	0.049439	-1.263433	0.2245
LNUNEMP(-4)	0.152126	0.057016	2.668124	0.0168
C	0.279302	0.285941	0.976782	0.3432
FITTED^2	-0.013749	0.020548	-0.669103	0.5130

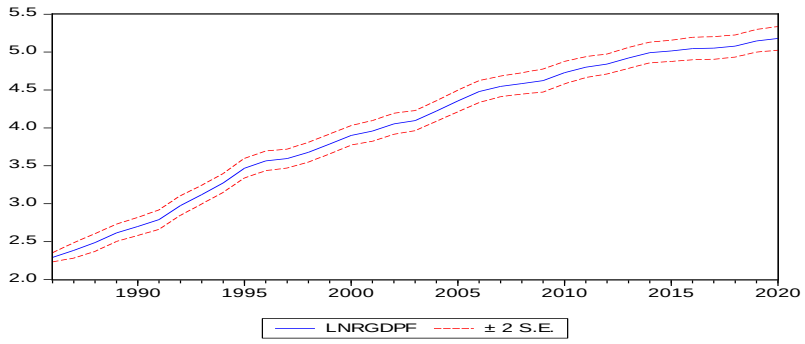
R-squared	0.999693	Mean dependent var	4.010504
Adjusted R-squared	0.999347	S.D. dependent var	0.913413
S.E. of regression	0.023337	Akaike info criterion	-4.374563
Sum squared resid	0.008714	Schwarz criterion	-3.530231
Log likelihood	95.55485	Hannan-Quinn criter.	-4.083100
F-statistic	2892.693	Durbin-Watson stat	2.818161
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

RESIDUALS



FORECAST



Forecast: LNRGDPF	
Actual: LNRGDP	
Forecast sample: 1981 2020	
Adjusted sample: 1986 2020	
Included observations: 35	
Root Mean Squared Error	0.026038
Mean Absolute Error	0.021062
Mean Abs. Percent Error	0.533192
Theil Inequality Coefficient	0.003168
Bias Proportion	0.000343
Variance Proportion	0.001505
Covariance Proportion	0.998151