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Economic reforms and economic growth in Nigeria: A Chow test approch

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Abstract. The study examined the impact of economic reform programmes on economic growth in Nigeria for the period 1980 – 2016. This period was selected since it covered the period of three main economic reform programme in Nigeria history. The reform programmes during the period were the Structural Adjustment Programme (SAP) of 1986, The National Economic Empowerment and Development Strategy (NEEDS) of 2004 and the transformation agenda of 2011. A combination of co-integration and error correction modelling techniques and the chow breakpoint test were employed. In the estimation of the specified model, dummy variables were constructed to capture economic reform programmes. The chow test was adopted to confirm the findings from the error correction representation by checking for structural brakes the growth function. The empirical result shows that economic reforms on the aggregate have positive and statistically significant long run impact on economic growth in Nigeria. However, in the short run the impact was negative. This suggest that economic reform had a J curve effect on economic growth in Nigeria. The J curve effect occur when a policy or programme have adverse effect in period immediately after its implementation. However, the effect reverse in the long run and become positive. For the individual reform programme, the structural Adjustment Programme (SAP) of 1986 didn't enhance economic growth in Nigeria. It even retarded economic growth with its negative coefficient. The National Economic Empowerment and Development Strategy (NEEDS) of 2004 and the transformation agenda of 2011 stimulated economic growth in Nigeria. This propelled the Nigeria economy to become the biggest economy in 2013 overtaking South Africa. Generally, the economic growth stimulated by economic reforms did not transform into economic development as the poverty level is still high, unemployment rate and other social indicator have negative trend. This could be as a result of abandonment of economic reforms following changes in political leadership of the country. This study therefore recommend the need to go back to government deliberate home grown economic reform programme to lunch the country back of a steady growth path which with the mind of attacking the poverty problem in Nigeria particularly as we approach the post covid-19 economic policy.
Keywords. Chow Breakpoint, Economic reform, SAP, NEEDS, Transformation agenda.
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1. Introduction

Nigeria like many Less Developed Countries (LDCs) have been engulfed in series of economic crisis. These countries are characterised by high incidence of poverty, high and rising unemployment, double digit inflation rate, high and unsustainable debt burden, sluggish economic growth and balance of payment problem (see CBN statistical bulletin various issues). These economic problems seems to be a direct consequence of the structural imbalances inherent in these economic systems. The Nigerian economy for instance according to Donli (2006) is undiversified, monolithic and monoculture production base depending heavily on crude oil export. Unfortunately, crude oil pricing is outside the control of the Nigerian government. The outcome therefore, is that the growth process relied seriously on external factors making her growth rate highly vulnerable to external shocks. According to Okonjo-Iweala & Osafo-Kwaako (2007), a major challenge of the Nigerian economy is its macroeconomic volatility driven largely by external terms of trade shocks and over dependence on oil export earnings making the country one of the most volatile economy in the world.

Governments of many developing countries have tried to initiate policies to address these structural imbalances in their economies. Brautigam (2007), opined that the only way for developing countries to come out of the problems of underdevelopment and thread on the path of sustainable growth is to structurally reform their economies. Economic reforms are the different macroeconomic and microeconomic policies designed by the government to redress the distortion and structural imbalances in the economy. Many countries of the world have undertaken different forms of economic reforms at one time or the other. The contents and strategy of these reforms vary from country to country depending on the circumstance of each country (Kwaneshie, 2005). Ogun (2018) added that a country implement economic reform policies mostly when that country is experiencing a prolong period of sluggish economic growth, in order to remove the distortion in the economic growth process.

Since the implementation of various economic reform policies in Nigeria, a lot of studies have been conducted to examine the impact of such reforms on the Nigerian economy. Such studies include but not limited to Obayelu & Okoruwa (2005), Appah & Ogbonna (2011), Abdu (2011), Ogbonna (2012), Opene & Odeh (2012), Golit (2013), Oyewale & Ogunleye (2014), Ejike (2015) and Ogun (2018). However, some of the studies were hinged on theoretical underpinning with no empirical support. Others based on empirical evidence relied on traditional estimation techniques except Golit (2013). Some other authors confined their study to specific sectors of the economy while studies like Golit (2013) restricted his empirical study to SAP thereby neglecting other major economic reforms such as NEEDS and the transformation agenda. This study is an attempt to fill this identified gaps by extending the estimation to cover SAP, NEEDS and the transformation agenda using modern estimation technique. This

study examined the relative impacts of SAP, NEEDS and the transformation agenda on economic growth in Nigeria.

2. Literature review

2.1. Economic reforms in Nigeria

Nigeria have implemented series of economic reforms to address the structural imbalance facing the economy. The first generation of reforms took place between 1986 and 1993, while the second generation of reforms was implemented between 1999 to date.

2.2. The structural adjustment programme (SAP):

The Structural Adjustment Programme (SAP) which constitute the first generation of economic reform in Nigeria was introduced on July 1, 1986 during the regime of General Ibrahim Babagida. The Nigeria SAP which was originally designed for two years period was built to fit the standard IMF – World Bank structural adjustment package Anyanwu, 1992).

The specific objectives of SAP include:

i. To restructure and diversify the productive base of the economy in order to reduce dependency on oil sector and on import:

ii. To achieve fiscal and balance of payment viability over the period;

iii. To lay the base for asustainable non-inflating growth;

iv. To reduce the dominance of unproductive investment in the public sector, unproductive investment in the public sector, improve the sector's efficiency and enhance the growth potential of the private sector.

The policy trust of SAP according to Anyanwu (1992) was to reduce the fiscal dominance of government and introduce deregulated market system. Hence, the main elements of the Nigerian SAP include external debt management, removal of subsidies on petroleum products and fertilizer, trade liberalisation, establishment of Second – tier Foreign Exchange Market (SFEM)to allow market forces determine the exchange rate of the naira, privatization and commercialization of government enterprises, elimination of price control and commodity boards and interest rate deregulation.

SAP was expected to last till 1988 but was extended to 1993 before finally abandon in 1994. Some scholars particularly World Bank study groups and academics from main stream western scholarship have argued that SAP was the most revolutionary economic reform ever designed to pull Nigeria out of its ravaging economic crisis but failed due to bad leadership and corruption inherent in the system. However, this line of thought has been heavily criticized by African scholars on the ground that SAP which was an imported IMF –World Bank inspired adjustment package was not built to fit the peculiarity of the Nigerian state. It was a one cap fit all adjustment package for all developing countries. Hence, decades after the implementation of SAP, none of the objectives were met. According to Ukah (2014), the World Bank and IMF instigated SAP policy

has had a toll on the Nigerian economy and has made nonsense of the country's educational efforts.

2.3. The national economic empowerment and development strategy (NEEDS).

Upon the abandonment of SAP, second generation of economic reforms were implemented in Nigeria. Prominent among these are the National Economic Empowerment and Development Strategy (NEEDS) and the transformation agenda.

NEEDS is a medium term development strategy developed during the regime of Chief Olusegu Obasanjo with the main objective of reorienting values, generating employment, creating wealth and reducing poverty (NPC, 2004, 2011, 2014, 2017). NEEDS which is a Nigerian home-grown poverty reduction strategy has some unique features that distinguished it from previous plan efforts. These are:

i. Participatory process – to ensure ownership and sustainability
ii. Scope and coordination – to reflect federalist planning
iii. Content – more focused, realistic and reformed based. (NPC, 2004, 2011, 2014 , 2017).

NEEDS was based on three pillars, these are:

i. Empowering people and improving social services
   - Health
   - Education
   - Integrated rural development
   - Housing development
ii. Fostering economic growth particularly the non-oil private sector
   - Security and rule of law
   - Infrastructure
   - Finance
   - Sectorial strategies
   - Privatization / liberalization
   - Trade and regional integration
iii. Enhancing the effectiveness and efficiency of government and improving governance
   - Public sector reforms
   - Privatization / liberalization
   - Governance, transparency and anti-corruption
   - Service delivery (IDA-IMF, 2005).

According to Staff of IDF and World Bank, NEEDS is a significant achievement as it clearly articulate a coherent and comprehensive vision for economic growth and poverty reduction in Nigeria. Furthermore, they noted that NEEDS correctly identify the key challenges facing Nigeria and proposes a sound response to each (IDA-IMF, 2005). However, Eneh & Alosysius (2016) on the contrary noted that NEEDS did not address the fundamental problems of Nigeria and moreover that the programme failed due to ill equipped managers.

2.4. The transformation agenda

The transformation agenda was the reform policy designed during the administration of President Goodluck Jonathan to reposition the Nigerian economy. According to Alao (2013), the policy was hinged on the prevalence of rule of law where equality, peace and justice shall reign; Addressing the rising unemployment, inequality, poverty as well as other flaws affecting the development of the Nigeria economy; Acquiring technology, developing internal market through private sector tostimulate local demand; and Promoting aggressive import substitution to block economic leakages. The key reforms in the transformation agenda include the following:

i. To reform and ensure that the Customs conform to global practices

ii. To facilitate a bill to National Assembly to give constitutional backing to traditionalrulers as custodians of the traditions and customs of the people

iii. To make the new tax policy to address the multiple taxation and related issues and makeit become a thing of the past

iv. To lead by example; strengthen the anti-graft agencies, not interfere and give free handon all matters of investigation against any government official.

v. To build a new economy that is strong and dynamic and underpinned by a patrioticwork ethic'.

vi. To continue to run a government that is committed to fairness, equity and justice for all.

The transformation agenda designed project and programmes which centred on infrastructural development, power, economy, energy and gas, security, agriculture, education, women empowerment, water resources, mineral resources and Niger Delta development. According to Nwogbaga (2014), a total budget of ₦5, 666,952.54 (in ₦ Million) was designed to cover the period 2012 – 2015. Development of physical infrastructure had the lion share with a budget allocation of 28.10%. Transport had a share of 21.79% while the real sector was allocated 14.17% of the total budget. Agriculture and rural development was allocated 6.96%, while defence and security and human capital had 10.40% and 9.67% of the total budget respectively.

The transformation agenda according to Nwogbaga (2014) was a welcome development given that laudable achievements recoded following the implementation of the policy. However, as Alao (2013) noted, the policy is far from realizing the primary goals which revolves around improving the social – economic wellbeing of the citizens given the various statistics from the National Bureau of Statistics.

Some studies have been conducted on the relationship between economic reforms and economic growth for various periods. From available literature, the impact of economic reforms on economic growth are mixed.

Obayelu & Okoruwa (2005) examined economic reforms and their impact on the Nigerian agricultural sector using some indicators such as the GDP, price of agricultural products, prices of agricultural inputs, effect on poverty, effect on both import and export, effect on quantity of agricultural products. This was done through extensive review of various forms of economic reforms in the sector since the pre-colonial era and comparing their effects, both negative and positive on the entire stakeholders: the farmers, consumers as well as governments and the economy as a whole. The result shows that the Nigeria economic reforms in the agriculture sector is the best option on revitalizing the agricultural sector and thus economic growth if and only if there is honesty in the execution of the reform exercise. The reforms brought about increased food production and increased foreign exchange earnings.

Narayana & Ghosh (2005) examined the impact of the 1991 reforms on the Indian economy using the Ordinary Least Square (OLS) method. From their result they found that Private final consumption expenditure (PFCE), investment (GCF) and all the GDP variables except that of services were found to be substantially higher during the post-reforms period than what they would have been in the absence of the reforms. They also found that reforms seem to have made only a marginal impact on investment in the agricultural sector. They therefore recommended that more reforms would be necessary to grow the economy at an accelerated rate

Vadlamannati (2008) investigated the impact of economic reforms on poverty levels in India during the period 1975 - 2006. He constructed a comprehensive measure of economic reforms index made up of seven subcomponents and percentage of population living below poverty line was used as proxy for aggregate level of poverty levels. The empirical study was conducted within the frame work of unit root, co integration and Vector Error Correction Method tests. The results showed a long run equilibrium relationship between economic reforms and poverty levels and the direction of causality flowing from reforms to poverty. The study also discovered that the recent sets of economic reforms had a positive effect on poverty levels, but set of reforms have significant negative effects on poverty levels. This according to him meant that the immediate adjustment cost of current levels of economic reforms is counterbalanced by the negative effects by the level of past reforms during the study period.

Appah & Ogbonna (2011) examined the impact of tax reforms on the growth of the Nigerian economy from 1994 – 2009. To achieve the objective of the study, the study specified a model that consists of Gross Domestic Product (GDP), Value Added Tax (VAT),Education Tax, Personal Income Tax (PIT), Company Profit tax and Customs and Excise Duty. Data were collected from the Central Bank of Nigeria, (CBN) statistical bulletin, Federal Inland Revenue Services (FIRS), and office of the Accountant General. The data collected were analysed using descriptive statistics and econometric models such as White test, Ramsey RESET test, Breusch Godfrey test, Jacque Berra test, Augmented Dickey fuller test, Johansen test

and Granger causality test. The results from the various test shows that tax reform is positively and significantly related to economic growth and that tax reforms granger causes economic growth. The study concluded that tax reforms improve the revenue generating mechanism of government to undertake socially desirable expenditure that will translate to economic growth. However, it was recommended that sustainable economic growth cannot be attained with tax reform processes except obsolete tax laws and rates are reviewed in line with macroeconomic objectives, corrupt-free and efficient tax administrative machinery with personnel's accountability and transparency of government officials in the management of tax.

Abdu (2011) investigates the extent to which the goal of poverty reduction has been achieved after the first phase of the implementation of NEEDS (2004-2007). The paper adopted the content analysis of library materials, publications and other documented researches pertaining to the subject-matter. The paper concludes that NEEDS has not made a significant impact on Nigeria's infrastructures and standard of living of the majority and therefore status of poverty remain at an alarming rate. The failure of NEEDS to significantly generate employment and reduce poverty has been attributed largely to weak institutional frameworks and lack of political will in the Nigerian state. To achieve poverty reduction and economic progress in Nigeria, majority of Nigerians must have access to quality education and the leadership must be truly committed to the economic reform agenda by encouraging development of stronger State institutions and creating an enabling investment environment.

By employing a multivariate time series model, Svitana & Rabbani (2011) examined the relationship between economic reforms, human capital and economic growth in India and South Korea. They advanced theoretical and empirical evidence on the role of economic reforms and human capital accumulation in the post – reform economic growth. They constructed two indexes – a human capital index and a composite economic reform index – and performed a co-integration analysis of a long run equilibrium growth path in India and South Korea twelve years after the implementation of reform. Their results showed that a significant positive effect of human capital accumulation is revealed in both India and South Korea. The impact of economic reforms is found to be heterogeneous across countries; the effect is positive, significant and sizeable in South Korea while it is negative and relatively small in India. This result is suggestive of different degree of efficiency of reform measures of implementation in the two countries.

Ogbonna (2012) examined the impact of Structural Adjustment Programme (SAP) on the Nigerian economy. The study was bifurcated into pre-SAP (1960-1985) and during SAP (1986-2008) to enable the investigation of how SAP achieved the cardinal objectives of exchange rate stability, minimal price escalation and trade balance adjustment. The variables of the model are exchange rate, trade balance and consumer price index. Using quarterly data for the period 1960-2008, the study employed a co integration analysis and Error Correction Mechanism (ECM) technique to

test if the objectives were achieved. The results suggest that in the two periods under review, the role of exchange rate depreciation in trade balance adjustments appears to be inconsequential. The results further suggest that the problem of Nigeria appear not to be that of demand management as diagnosed by the prescribers of SAP, but rather that of supply. The exchange rate remained volatile and kept a downward trend while inflation and import index kept rising profiles. All these suggest the SAP failed to achieve the cardinal objectives in terms of exchange rate stabilization, minimum acceptable inflation rate substantial reduction in import demand index and non-oil export promotion. The study concluded that the CBN play its stabilizing role in the economy through reversed appropriate economic policies tailored towards effective supply management for improvised internal and external sector performance.

Opene & Odeh (2012), examined the relevance of NEEDS in the growth of the Nigerian economy from 1999 to 2010. Using time series data, they specified a model that consisted of the following variables-: Foreign Direct Investments (FDI), industrial output, exchange rate, inflation and population. The study adopted the ordinary least squares estimation techniques and the results showed that foreign direct investment exchange rate, industrial output and population exhibited a positive relationship with economic growth (proxy with real gross domestic product RGDP) and both FDI and population were statistically significant and explained about 79.2% and 81.6% respectively of the total variations in the RGDP. The study concluded that with the implementation of NEEDS, the economy witnessed an increased inflow of FDI (especially in aviation, telecoms and services sectors) and this brought about employment generation and wealth creation, hence the recommendation of increased inflow of FDI in other sectors of the economy as this will promote economic growth and create employment.

Gyong (2014), examined the Transformation Agenda as an economic reform programme to ascertain its impact on the growth of Nigeria's economy. He noted that a number of threats and challenges exists that hindered the realization of the Transformation Agenda. These according to him includes absence of good governance and accountability, ineffective public service, incessant problem of insecurity, corruption, bankrupt leadership, faulty development agenda that drove the Transformation Agenda. He concluded that there is need to take bold steps towards exploiting the maximum benefits of the opportunities of such reform policies while simultaneously reducing to the barest minimum, the threats and challenges facing it. Most importantly, some fundamental measures need to be taken in the thinking and actions of the leadership of the country. Also there is need for a radical development strategy that will guarantee inclusiveness as opposed to exclusiveness in the governance of the Transformation Agenda.

Oyewale & Ogunleye (2014) assessed the Impact of Transformation Agenda on Economic Performance in Nigeria. Using times series data, the

study adopted SPSS 15.0 economic software for its regression analysis. The results showed that Nigeria achieved a modest macro-economic stabilization due to many reforms embarked upon by the government in the recent time with performance rates averaged between 3.5 percent and 7.0 percent. The study concluded that the Transformation Agenda impacted positively in Nigeria's economic growth. The study went further to recommend that for the Transformation Agenda to be meaningful, government must address the enormous challenges it faces in the areas of multiplicity of projects in the face of dwindling resources and the need to articulate a cohesive programme that is well focused and implementable so as to address the challenge of decay and inadequate infrastructure and growing unemployment, particularly of youths.

Ejike (2015) examined the impact of Economic Reform on the growth and development of the Nigerian economy. The scope was 1980 -2015. He specified a model which was used in the evaluation of the impact of economic reform on the growth and development of the Nigerian economy. The variables in the model consists of Foreign Direct Investment (FDI), Investment, inflation capacity utilization exchange rate, human capital development and a dummy was used to capture reform. Using the ordinary least squares regression technique, he found that economic development increased by 16 percent during the reform period as compared to the non-reform periods. Economic growth increased by 4 percent during the reform as compared to the non-reform period, hence accepting the alternative hypothesis that there is a positive relation between economic reforms and economic growth and development.

Golit (2013) investigated the relationship between structural changes and real output growth in Nigeria. The study which involves an examination of the impact of structural reforms on real output growth employed a combination of cointegration and error correction modeling, granger causality analysis and the chow breakpoint test for the period 1060 – 2011. The result revealed that the real output function did not remain the same before and after the economic reforms programmes. This means that structural reform programmes have significant impact on real output growth in Nigeria.

Max & Aduma (2016) undertook a comparative study of SAP and NEEDS reform strategies with a view to ascertaining whether NEEDS succeeded where SAP failed. The study employed the qualitative descriptive analysis to compare the effect of NEEDS and SAP of the Nigerian economy. The study concluded that NEEDS did not actually succeeded in redirecting the growth trajectory of the Nigerian economy particularly its impact on the poor. The study noted that the formulation and implementation of NEEDS was not home grown as speculated by the NEEDS document but inspired by the World Bank / IMF just like SAP. Moreover, the reform was a short term plan and the managers were ill equipped. It was therefore the view of the authors that NEEDS may have

spur growth but did not significantly impact on poverty reduction, economic and social empowerment of the poor.

Okoli, Ocheeni & Orok (2019) employed the Autoregressive Distributed Lagged bounds testing procedure and error correction modelling technique to examine the effect of banking sector reforms on economic growth in Nigeria for the period 1970 – 2015 using annual time series data. Their result shows that the implementation of the banking sector reform did not impact significantly on the growth of the Nigerian economy. The study opined that the failure of the banking sector reform maybe due to the profit maximization drive of the Nigerian Banks which may have a counterproductive effect on the country's economic growth process.

3. Theoretical framework

The theoretical foundation upon which the IMF and the World Bank based their economic reform prescription was the neo-classical economic ideology. The neo-classical economics assumed an open economy, operating under a competitive market framework.

Therefore, given a four sector macroeconomic model

$$Y = C + I + G + X - M \quad (1)$$

Where:
C = Aggregate consumption
I = Aggregate Investment
G = Total government expenditure
X = Total export
M = Total import

(C + I +G) constitute the amount of goods and services absorbed in the economy from domestic production (Y). (X – M) is the net balance of the external sector.

From equation 1:

$$(X - M) = Y - (C + I + G) \quad (2)$$

Equation 2 shows the national balance which is external balance (X – M) and the internal balance (Y – (C+I+G)). When there is a deficit in the external sector, such deficit can be corrected by either increase output (Y) (i.e. supply side stabilization) or reduce absorption (C + I + G) (demand side stabilization). However, due to technological deficiency in the developing countries, increasing production level is often difficult in the short run. Therefore, the most feasible policy option to restore equilibrium is to reduce domestic absorption which involves the lowering of demand (belt-tightening option). This can be achieved through a combination of fiscal and monetary policies. Hence, IMF identified the government sector as a major source of macroeconomic imbalance. It follows therefore that reforms

focused on the reduction in the size of the public sector would be a viable policy option for developing countries.

The above sector-based macroeconomic framework provide a useful tool for explaining variables subjected to stabilization polices. However, the equations were identities without basic information on how the macroeconomic variables were linked. In order to provide a clearer understanding of the basis of the reform policy there is need to explore the behavioural relationship between the macroeconomic variables and subsequently formulate testable hypothesis.

4. Model and method

Flowing from the theoretical framework, the model for estimation in the study adapted Golit (2013) growth model. This model which state real GDP as a function of degree of openness, real exchange rate, interest rate, FDI, manufacturing capacity utilization and economic reform dummy was modified in the this study to accommodate the fiscal and monetary policy actions of government which is a key macroeconomic policy action in Nigeria.

Therefore, the implicit model for specification in this study is given as

$$RGDP = f(LFPR, TECH, GEXP, MS, ER) \quad (3)$$

Where:
RGDP = Real Gross Domestic Product
LFPR = Labour Force participation rate
GEXP = Government expenditure (Fiscal policy action)
MS = Money supply (Monetary policy action)
ER = Dummy for Economic Reform programme
0 = period without the programme
1 = period of the reform Programme

The econometric form of the model with aggregate economic reform is given as

$$RGDPt = \beta_0 + \beta_1 \Delta LFPR_{t-i} + \beta_2 \Delta TECH_{t-i} + \beta_3 \Delta GEXP_{t-i} + \beta_4 \Delta MS_{t-i} + \beta_5 \Delta ER_{t-i} + \beta_6 (RGDP_{t-1} - \beta_0 + \beta_1 LFPR_{t-1} - \beta_2 TECH_{t-1} - \beta_3 GEXP_{t-1} + \beta_4 MS_{t-1} + \beta_5 ER_{t-1}) + e_t \quad (4)$$

The items in bracket in equation 2 correspond to one lagged of e_t i.e. $(RGDP_{t-1} - \beta_0 + \beta_1 LFPR_{t-1} - \beta_2 TECH_{t-1} - \beta_3 GEXP_{t-1} + \beta_4 MS_{t-1} + \beta_5 ER_{t-1}) = e_{t-1}$

$$RGDPt = \beta_0 + \beta_1 \Delta LFPR_{t-i} + \beta_2 \Delta TECH_{t-i} + \beta_3 \Delta GEXP_{t-i} + \beta_4 \Delta MS_{t-i} + \beta_5 \Delta ER_{t-i} + \beta_6 e_{t-1} + e_t \quad (5)$$

Where:
e_{t-1} = error correction mechanism (the expected sign is negative)
The specific reform programme models are given as

$$RGDPt = \beta_0 + \beta_1 \Delta LFPR_{t-i} + \beta_2 \Delta TECH_{t-i} + \beta_3 \Delta GEXP_{t-i} + \beta_4 \Delta MS_{t-i} + \beta_5 \Delta SAP_{t-i} + \beta_6 e_{t-1} + e_t \quad (6)$$

$$RGDPt = \beta_0 + \beta_1 \Delta LFPR_{t-i} + \beta_2 \Delta TECH_{t-i} + \beta_3 \Delta GEXP_{t-i} + \beta_4 \Delta MS_{t-i} + \beta_5 \Delta NEEDS_{t-i} + \beta_6 e_{t-1} + e_t \quad (7)$$

$$RGDPt = \beta_0 + \beta_1 \Delta LFPR_{t-i} + \beta_2 \Delta TECH_{t-i} + \beta_3 \Delta GEXP_{t-i} + \beta_4 \Delta MS_{t-i} + \beta_5 \Delta TA_{t-i} + \beta_6 e_{t-1} + e_t \quad (8)$$

Where:
SAP = Structural Adjustment Programme
NEEDS= National Economic Empowerment and Development Strategy
TA = Transformation Agenda
And $\beta_0 \neq 0, \beta_1, \beta_2, \beta_3, \beta_4 \beta_5 > 0$; $\beta_6 < 0$

The data used for the paper were sourced from Central Bank of Nigeria (CBN) annual reports and Statistical Bulletins, National Bureau of Statistics (NBS) and World Development Indicators (WDI).

5. Results and discussion of findings

5.1. Unit root test

The time series properties of the date were test using unit root test and co-integration test. The unit root test was based on the Augmented Dickey Fuller (ADF) test is presented in table 1 below.

Table 1. *Unit root test*

	Unit root test in level			Unit root test for first order difference			
Variables	Computed ADF	Critical ADF	Remarks	Computed ADF	Critical ADF	Remarks	Order of integration
RGDP	1.6328	2.9511	Non stationary	3.0772	2.9511	Stationary	I(1)
LFPR	2.0460	2.9571	Non stationary	6.5511	2.9511	Stationary	I(1)
TECH	0.0851	2.9484	Non stationary	4.4219	2.9511	Stationary	I(1)
GEXP	2.0471	2.9639	Non stationary	4.4219	2.9511	Stationary	I(1)
MS	3.8170	2.9484	Stationary	-	-	-	I(0)

Source: Author's computation 2021.

From the above result all the variables except money supply were stationary in first order difference. This means they are integrated of order on which money supply is integrated of order zero. Since the variable are integrated of the same order, the Engle-Granger Co-integration Test was adopted to test for co-integration.

5.2. Co-integration test

The co-integration test was conducted to ascertain if a long-run relationship exists among the variables in the model. The Engle-Granger

co-integration test is more suitable in cases like this (Gujarati, 2004). The result is shown in Table 2 below:

Table 2. *Engle-Granger co-integration test*

Variable	Tau- Statistics	Probability	Z- Statistics	Probability
RGDP	-4.3451	0.7619	-341.5038	0.0000
GFCF	-4.7675	0.5980	-43.0123	0.0166
LFPR	-5.7008	0.2549	-62.5523	0.0000
TECH	-4.7223	0.6191	-244.0675	0.0000
FDI	-4.8816	0.5484	-28.8719	0.5443
GEXP	-3.1967	0.9832	-49.7546	0.0003
ECNR	-4.0987	0.8390	-35.5672	0.1686

Source: Author's computation 2021.

Judging by the Z-statistics and its corresponding probability value, there are at least five co-integrating equations in table 2 above. This means that the variables are co-integrated and it can be concluded that a long-run equilibrium relationship exists among the variables.

5.3. Short run and long run estimate

Error correction representation and long run coefficient are presented in the table below:

Table 3. *Error correction representation and long run coefficient*

	Short run coefficients				Long run coefficients			
Coefficients	Aggregate model (1)	SAP model (2)	NEEDS model (3)	Transformation agenda model (4)	Aggregate model (5)	SAP model (6)	NEEDS model (7)	Transformation agenda model (8)
RGDP(-1)		0.7613	0.8865*					
		(1.1819)	(2.0697)					
LFPR	-2.2918*	0.8652*	1.7426*	0.4026**	4.0140*	0.2793*	0.7915*	3.8735*
	(-4.1821)	(2.5588)	(4.1340)	(1.9865)	(4.1108)	(2.0561)	(2.5208)	(2.8024)
LFPR(-1)	1.1568*		1.9168*					
	(3.0037)		(2.7441)					
LFPR(-2)	-0.5119							
	(-1.0398)							
TECH	0.3649*	0.3948*	2.4494*	0.8235*	7.2596*	1.2748*	0.5673*	1.2129*
	(2.3698)	(2.1686)	(2.0199)	(3.8063)	(2.4369)	(2.1264)	(2.1671)	(2.3535)
TECH(-1)				-0.6373				
				(-2.5851)				
GEXP	1.5544*	1.3271	2.4138***	2.6976*	6.2148*	3.5503*	1.0467*	0.5916*
	(2.2838)	(1.584)	(1.4631)	(3.5508)	(9.5582)	(2.0736)	(5.2148)	(2.5828)
GEXP(-1)		1.5529**	5.3729*					
		(1.7758)	(2.9096)					
MS	-0.3376	0.7376	0.5580	-3.3486*	3.3461*	3.5189*	0.9912*	0.5916*
	(-0.4283)	(0.8744)	(0.4828)	(-2.9040)	(5.1141)	(2.3044)	(2.5953)	(2.5828)
MS(-1)		0.8053	5.4553*	1.4740*				
		(0.9886)	(2.7859)	(2.2585)				
MS(-2)		1.9712*	2.2183*					
		(3.1702)	(2.4702)					
ER	-1.7320**				5.3172*			
	(-1.9961)				(3.7740)			

ER(-1)	-3.2655*							
	(-3.2913)							
SAP		-1.4396				-4.6470*		
		(-1.077)				(-2.6003)		
NEEDS			2.3864*				1.2363*	
			(2.0015)				(3.5128)	
NEEDS(-1)			2.7016*					
			(2.5964)					
TA				0.6467				1.5161*
				(0.8886)				(2.7440)
TA(-1)				1.1849*				
				(4.0317)				
TA(-2)				0.7595*				
				(3.8037)				
CONSTANT	-3.2655*	5.0246*	1.8509*	0.2600	2.3381*	1.6219*	4.2872*	2.5011*
	(-3.2913)	(2.5608)	(3.5463)	(0.1105)	(4.1682)	(2.0996)	(2.4478)	(0.1156)
ECM (-1)	-0.5027*	-0.3097*	-0.4317*	-0.2039*				
	(-4.0196)	(-2.7514)	(-3.5291)	(-2.0200)				
F- STAT	14.8971	12.3506	9.9492	13.5757				
R^2	0.8816	0.8488	0.8838	0.8660				

Source: Author's computation 2021.

The results above shows estimate for growth model with aggregate economic reform dummy and also growth models with disaggregate economic reform dummies for individual reform programmes including SAP, NEEDS and transformation agenda. Each reform programme is introduced one after the other in separate model in other to avoid dummy variable trip that may occur if all the reform programmes are included in the same model. Colum 1 to 4 shows estimate of short run error correction representation, while Colum's 5 to 8 shows the long run estimates. In Colum 1, estimates for aggregate reform dummy were presented. In Colum 2, SAP dummy was introduces while NEEDS dummy was introduced in colum 3. Transformation agenda dummy was introduce in colum 4. In all the four error correction models, the ecm(-1) were properly signed and the coefficient were statistically significant. This shows that there is both short run and long run equilibrium in the system. In colum 1, the ecm has a coefficient of -0.5027 which revealed that system correct its previous period disequilibrium at a speed of about 50% in each period. In Colum 2, 3 and 4, the ecm have coefficients of -0.3097, -0.4317 and -0, 2039 respectively. This shows that for each model the speed of adjustments for each previous period disequilibrium were about 30%, 43% and 20% for Colums 2, 3 and 4 respectively. These are clear indications that the models specified are dynamically stable and a further confirmation that the variables selected are indeed co-integrated.

The aggregate economic reform dummy (ER) has a coefficient of -1.732 and a corresponding t- ratio of -1.9961 for the short run model. The long run coefficient was 5.3172 and a t-ratio of 3.7740. This is an indication that economic reform on the whole have significant impact on economic growth in Nigeria. In the short run the impact maybe adverse but in the long run

economic reform has a positive and significant impact on economic growth in Nigeria.

To examine the impact of individual reform programes on economic growth in Nigeria, the following specific reforms were selected SAP, NEEDS and the transformation Agenda. The estimate shows that the SAP dummy has a negative impact on economic growth in both short and long run. However, the impact was not statistically significant in the short run, it was highly significant in the long run. Also the result revealed that NEEDS and the transformation agenda reform programmes have positive and significant impact on economic growth in Nigeria both in the short run and in the long run.

Diagnostic test

The above estimates were subjected to diagnostic test for reliability. The Breusch-Godfrey serial correlation L.M test was used to test for serial correlation while the Breusch-Pagan Godfrey test was adopted for heteroscedasticity test. The results are presented in the table below:

Table 4. *Serial correction and Heteroscedasticity test*

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.549678	Prob. F(2,30)	0.0949
Obs*R-squared	5.520772	Prob. Chi-Square(2)	0.0633
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.471941	Prob. F(5,32)	0.7943
Obs*R-squared	2.609709	Prob. Chi-Square(5)	0.7599
Scaled explained SS	2.272602	Prob. Chi-Square(5)	0.8103

Source: Author's computation 2021

From the above results, since the probability chi square is greater than 0.05, it shows that there no serial correlation in the model. Also the distribution of the residuals are homoscedastic. The cumulative sum (CUSUM) chart was used to study the stability of the model. From the result, the estimated parameters are stable since the CUSUM line remain within the upper and lower bounds of the CUSUM graph as shown in the chart 1 blow. The test for normality was also conducted using the histogram test. The result was conducted at 5% level. The result shows that that histogram was properly shaped. Also, the Jarque-Bera statistics was 0.089 which is greater than 0.05. This clearly shows that the residual was normally distributed. From this results it can be concluded that the residual which is random, is normally distributed and homoscedastic with no evidence of serial correlation. On this basis it can be stated that $\varepsilon_t \sim N(0, \sigma^2)$, Hence, the estimate are BLUE.

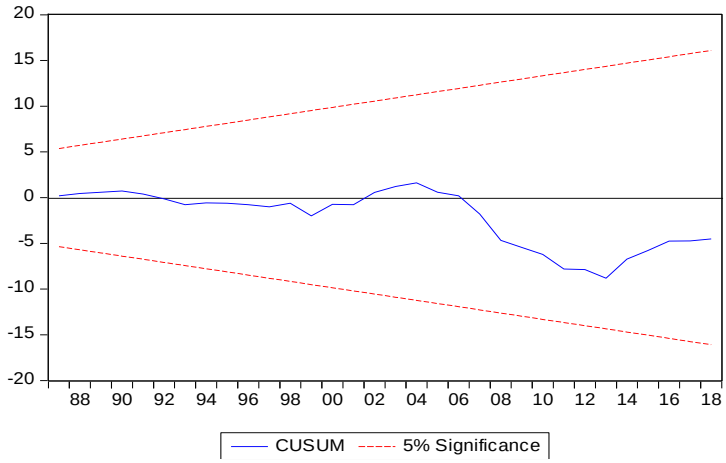

Figure 1: *CUSUM test*

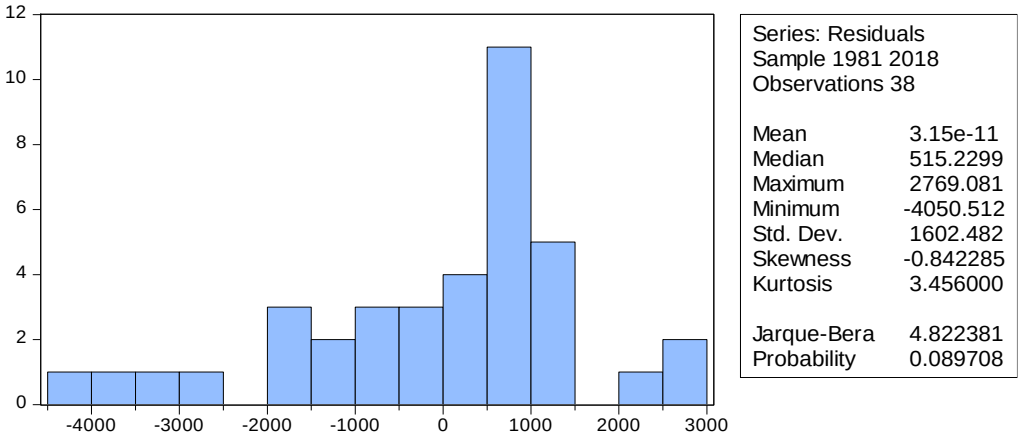

Figure 2. *Histogram test for normality*

Given that the dialogistic test shows reliability of the estimate, it becomes safe to proceed with the chew breakpoint analysis.

5.3. The Chow breakpoint test for economic reforms programmes in Nigeria

The impact of individual economic reforms programmes on the economic growth time path was analysis further using the chow breakpoint test analysis. The table below shows the various chow breakpoint test result for Structural Adjustment Programme (SAP), THE National Economic Empowerment and Development Strategy (NEEDS) and the Transformation Agenda (TA).

Table 5. *Chow breakpoint test*

Structural Adjustment Programme (SAP)			
1987		1988	
F- Statistics 0.7344	Prob. F(6,24)0.6268	F-Statistics 0.9373	Prob. F(6,24)0.4868
Log Likelihood 6.0682	Prob. Chi-sq 0.4156	Log Likelihood 7.5794	Prob. Chi-sq 0.2706
Wald Statistics 4.4064	Prob. Chi-sq 0.6218	Wald Statistics 5.6242	Prob. Chi-sq 0.4666
The National Economic Empowerment and Development Strategy (NEEDS)			
2003		2004	
F- Statistics 5.5920	Prob. F(6,24)0.0010	F-Statistics 17.0974	Prob. F(6,24)0.0010
Log Likelihood 31.4872	Prob. Chi-sq 0.0000	Log Likelihood 59.8629	Prob. Chi-sq 0.0000
Wald Statistics 33.5225	Prob. Chi-sq 0.0000	Wald Statistics 102.5848	Prob. Chi-sq 0.0000
The Transformation Agenda (TA)			
2011		2012	
F- Statistics 5.4122	Prob. F(6,24)0.0012	F-Statistics 6.1603	Prob. F(6,24)0.0005
Log Likelihood 30.8058	Prob. Chi-sq 0.0000	Log Likelihood 33.5590	Prob. Chi-sq 0.0000
Wald Statistics 32.4735	Prob. Chi-sq 0.0000	Wald Statistics 36.9619	Prob. Chi-sq 0.0000

Source: Author's computation 2021

The first set of results show the Chow breakpoint test for the real output equation covering 1981- 2016. This examine the SAP reform. The programme was implemented in 1986 but actually became fully operational in 1987. Hence the Chow breakpoint was conducted for 1987 and 1988 to accommodate the effect of delayed response. In 1987, the F-statistics has a coefficient of 0.7344 with a corresponding probability value of 0.6268. The Log. Likelihood coefficient was 6.0682 with a Chi-square value of 0.4156. Similarly, the Wald statistics is 4.4064 with a probability chi-square value of 0.6218. These results failed to show the existence of breaks at the specified breakpoints. In 1988, the F-statistics has a coefficient of 0.9373 with a corresponding probability value of 0.4868. The Log. Likelihood coefficient was 7.5794 with a Chi-square value of 0.2706. Similarly, the Wald statistics is 5.6242 with a probability chi-square value of 0.4666. These results again consistently failed to show the existence of breaks at the specified breakpoints. The above results show that RGDP remained the same before and even after the implementation of SAP in Nigeria. This however implies that the economic reform package implemented during SAP did not significantly influence economic growth in Nigeria. This is a further confirmation of the results from the short run error correction model presented earlier.

The second set of result was for the NEEDS reform programme. The NEEDS programme was implemented fully from 2003. Hence the Chow breakpoint test was conducted for 2003 and 2004 to accommodate the effect of delayed response. In 2003, the F-statistics has a coefficient of 5.5920 with a corresponding probability value of 0.0010. The Log. Likelihood coefficient was 31.4872 with a Chi-square value of 0.0000. Similarly, the Wald statistics is 33.5225 with a probability chi-square value of 0.0000. These results show the existence of breaks at the specified breakpoints. In 2004, the f-statistics has a coefficient of 17.0974 with a corresponding probability value of 0.0010. The Log. Likelihood coefficient was 59.8629 with a Chi-square value of 0.0000. Similarly, the Wald statistics is 102.5848 with a probability chi-

square value of 0.0000. These results again consistently show the existence of breaks at the specified breakpoints. The above results show that RGDP did not remain the same before and even after the implementation of NEEDS in Nigeria. This implies that the economic reform package implemented during NEEDS significantly influenced economic growth path in Nigeria. This again further confirmed of the results from the error correction representation and long run coefficient presented earlier.

The last set of result were for the transformation agenda. This programme was implemented fully from 2011. Hence the Chow breakpoint test was conducted for 2011 and 2012 to accommodate the effect of delayed response. In 2011, the F-statistics has a coefficient of 5.4122 with a corresponding probability value of 0.0012. The Log. Likelihood coefficient was 30. 8058 with a Chi-square value of 0.0000. Similarly, the Wald statistics is 32.4735 with a probability chi-square value of 0.0000. These results show the existence of breaks at the specified breakpoints. In 2012, the f-statistics has a coefficient of 6.1603 with a corresponding probability value of 0.0005. The Log. Likelihood coefficient was 33.5590 with a Chi-square value of 0.0000. Similarly, the Wald statistics is 36.9619 with a probability chi-square value of 0.0000. These results again consistently show the existence of breaks at the specified breakpoints. The above results show that RGDP did not remain the same before and even after the implementation of Transformation Agenda in Nigeria. This implies that the economic reform package implemented during transformation agenda significantly influenced economic growth in Nigeria. This also confirmed the results from the error correction representation and the long run coefficient presented earlier.

6. Discussion of findings

The study examine the impact of economic reforms on economic growth in Nigeria. The results shows that economic reforms on the aggregate have significant impact on economic growth in Nigeria both in the short run and in the long run. In the short run, the impact of reforms was significant but negative, while it has a positive impact in the long run. This suggest a kind of J curve effect on the impact of economic reforms on economic growth in Nigeria. This implies that on implementation of reform programmes the economic situation may appear worse off in the immediate period following the implementation. However, in the long run after all the adjustment in the various sectors of the economy the positive growth impact of the reform would become visible. The long run result for the aggregate economic reform model of this study is in line with the findings of Golit (2013), Ejike (2015), Narayana & Ghosh (2005) and Svitane & Rabbani (2011) in their findings from South Korea economy. However, the result was contrary to the findings of Svitane & Rabbani (2011) in their result from India economy.

On the specific reform programes, the impact of the Structural Adjustment Programme (SAP) on economic growth was not statistically

significant in the short run. However, in the long run it was even retarded economic growth in Nigeria. The short run result was further validated by the chow breakpoint test, as the growth function remain unchanged even after the implementation of the SAP. This findings was in line the results of Ogbonna (2012) and Max & Aduma (2016).

The impact of the National Economic Empowerment and Development strategy (NEEDS) on economic growth was positive and statistically significant in both the short run and in the long run. Also, the chow breakpoint test further validated the error correction representation findings. This clearly shows that the NEEDS programmes successfully lunch Nigeria on a rapid economic growth path. This result was in line with the findings of Opene & Odeh (2012) but contrary to the results of Abdu (2011) and Max & Aduma (2016).

The impact of the transformation agenda on economic growth was positive and statistically significant both in the short run and long run in Nigeria. The chow breakpoint test also revealed the growth function was not same before and after the implementation of the transformation agenda in Nigeria. This implies the transformation agenda was stimulated economic growth in Nigeria. This was in line with the findings of Oyewale & Ogunleye (2014) and Gyong (2014).

On the whole, economic reforms programmes has enhanced economic growth in the Nigeria. But on specific programme SAP did not enhance economic unlike the NEEDS and transformation agenda. A close look at the programme shows some similarities. However, SAP was not home grown it was an economic package by the World Bank and IMF imposed on most less developed countries. The SAP programmes did not take into consideration of country's specific peculiarities. It was a one cap fit all policy, hence it failed to gain acceptability and lack manpower to understand and implement the various provisions adequately. The lessons from the failure of SAP was taken into consideration in the formulation and implementation of NEEDS and the transformation agenda was which home grown.

The success of economic reform in enhancing growth in Nigeria did not however transformed economic development. This is clear from the statistics of unemployment rate, inequality and poverty rate which are unacceptably and embarrassingly high in Nigeria.

7. Conclusion

The study examined the impact economic reforms on economic growth in Nigeria using a combination of co-integration and error correction model with dummy variables to capture the various economic reform programmes in Nigeria. The chow breakpoint test was also used as a confirmatory test. The result revealed that economic reform programme has the potential of enhancing economic growth in Nigeria. Specifically, SAP did stimulate economic growth in Nigeria. It even shows evidence that SAP retarded economic growth in Nigeria. The result could be that the

programme was not home grown. It was a package of the World Bank and IMF which did not take into consideration of the peculiarity of the Nigerian economy. It was a One cap fit all programmes for developing countries. The programmes that good policies but implementation and acceptability was low. The NEEDS and the transformation agenda were useful economic reforms that stimulated economic growth in Nigeria. Both reform were home grown from conception to implementation, hence they gained wide acceptability. Following the implementation of these two economic reform programme, Nigeria became the biggest economy in Africa overtaking South African in 2013.

Although, economic reforms in Nigeria boost economic growth. However, these growth did not transform to economic development. Poverty level is still high, unemployment and inequality is high and rising. Other social indicators of development shows negative growth.

Following the covid 19 pandemic that has further worsen the economic condition in the country there is an urgent need to evolve another set of home grown economic reform programme involving community participation from conception to implementation to lunch the country back to a steady growth course taking into consideration economic development dimension.

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