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# Fiscal policy and economic behaviour in Nigeria

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**Abstract**
Fiscal policy and economic behaviours in Nigeria, is a study carried out to determine the ways by which the economy can be made effective through the use of some policy instruments of the rate of real gross domestic product, government expenditure on health and education, personal income rate, company income rate and value income tax rate. It is based on these variables, this study investigate the fiscal policy behaviour in the economy in other to stimulate performance for the satisfactory socio-economic life of the population of the people in the country. Using the technique of autoregressive distributive lag model (ARDL) and error correction model (ECM) the investigation indicates that personal income tax rate has a negative significant effect on the rate of real gross domestic product at a five percent significant level. This implies that a one percent increase in personal income, tax rate leads to a zero point three percent fall in the rate of gross domestic product. That company income tax rate and government expenditure on health are both significant on real gross domestic product. And that company income tax rate negatively influence inflation at five percent level of significance. In addition is that a one percent rise in company income tax rate results to two point-two drops in inflation. Both value added tax and personal income tax have positive and significant effects on unemployment. However, government expenditure on education shows no significance. This study therefore recommend that government widens her tax base for more tax payers and corporate organizations to be imputed into the tax regimes. This should be done to ensure that more individuals and corporate bodies are enlivened with tax compliance while lower tax rates need to be put in place.

**Keywords:** ARDL, ECM, fiscal policy

## Introduction

Explaining fiscal policy in developed and developing countries is being a major subject of stabilization and development of economies. They reared their impressions in the middle of the nineteen thirties in lieu of the management of depressed economies of Western Europe and North America through the emphasis of Keynesian economic policies. Since World War II the use of fiscal policy has become imperative to disseminate inflation in other to maintain full employment. In modern economies, fiscal policy is the means most public sector use in the management of receipts (revenue) and expenditure. A governmental system can get rid-off undesirable variations in both consumption and investment by anti-cyclical variation of public expenditure and tax revenue. This is tantamount to stating that government uses revenue and expenditure policies to regulate and stabilize her economy. Fiscal policy is an economy's shock absorber. It essentially contains the decision of government itself to determine some macro-economic aggregates such as total government spending and tax revenues. In the view of Stein (1968), these are opposed to some aspects of public finance which are primarily concerned with the effect of specific government expenditures and taxes. However, fiscal policy is mainly determined in terms of public expenditure, tax revenue, public investment, Budgeting and debt matters.

According to Olaloku, Fajana, Tomori and Ukong (1987), [23], economic policy objectives in terms of fiscal policy are being pursued to some greater or lesser degree in achieving economic development in the developing economies. And that they are defined not only as a continuous and sustained growth in total output and as well as output per head but also as structural transformation from the under developed agricultural economies to fully industrialized ones. The impact of fiscal policies on developing economies in achieving economic development objectives have been specifically important relative to the use of other policies among monetary policy. Just like some other developing economies Nigeria, is yet to attain the desired aim in the development of her economy due to her pursuance of the fiscal policy measures. However, fiscal policy measures do foster growth and development through macro and micro economic influences and also through budget deficits on growth and the influence on efficiency of resource use respectively. However, the bone of contention is how, manageably and economically, do these channels work in the developing economies including Nigeria? How will Nigeria supersede, adopting macro-economic policies to realize these objectives? Is the fiscal policy stance in Nigeria yielding the desired macro-economic objectives? However, different efforts have been made through the use of fiscal policy instruments to stimulate the country's economic growth. According to Osuala and Jonee (2014), by endogenous growth model, government role in promoting accumulation of knowledge, research and development, productive public investment, human capital development, law and order can generate growth both in the short run and long-run. Another school of thought, Success, Success and Ifurueze (2012) are also of the same idea. Though Yadav, Upadhyay and Sharma (2012) are of the view that government systems differ ie being bureaucratic and inefficient can stifle rather than enhancing growth. But Abdenour and Tounsi (2015) [2] are of the view that fiscal policy impact on growth based on the findings of their

respective studies. In this regard most economists are of different views that fiscal policy may either stimulate or spur growth. The statement thus becomes an empirical question. The fact that most of the aforementioned ideologies fail to capture some viable macro-economic views in their studies there is need for a rethink. Specifically, these works do not capture behaviour of increases in the rate of unemployment and inflation in relation to the vagaries of the issues of real gross domestic growth rate there is need for a rethink, the fact that most fiscal policy instruments such as government expenditure on health, government expenditure on education, personal income tax rate, company income tax rate, value added tax rate are not captivated in their studies which calls for the need for further studies. In this regard this study is determined to investigate the fiscal policy beahviour in an economy; issues of the Nigerian case. In carrying out the study, the work is slated into five sections. Sector one treats the introduction. In section two theoretical and empirical literature is treated. Sections three and four show the methodology of the study and analysis respectively while section five treats summary, conclusion, and recommendations.

## Theoretical and Empirical Literature

### Theoretical literature

### Theory of fiscal policy

In 1936, Keynes postulated the theory of fiscal policy. This policy theory was as a result of the expressions of views of the economic realities as a result of the great depression. According to the theory, government can influence the level of macroeconomic output through the management of tax and expenditure matters. That the collective impacts of an increase in public expenditure and reduction in taxes through an expansionary fiscal policy can pull an economy out of recession but a decrease in expenditure and increase in taxes which is contractionary fiscal policy, may tend to slow down an economic boom. In this regard it is potent in controlling the cyclical fluctuations for building sustainable growth in that economy. By this policy a nerve centre is created by which a government influences its economic objectives to promote and maximize social welfare. This aspect incorporates a management system of the budget office with that of president or the finance minister with the power to act depending on policy issues. And that those who represent the government must have the public at heart in making policy decisions. The theory is of the view that, when budgetary decisions are made, the government must have best available economic analysis toward deriving the available resources for that decision arrived at and that such analysis must be based on reliable data, unbiased forecasts and an accepted economic principles stabling links between changes in policy instruments and changes in policy objectives. These are some reasons why Barra (1990) Laura (2008) [17] Macek (2014) [19] state that fiscal policy measure affects the level and growth of aggregate output. In recent times Eichenbaum and Fisher (2004) [11] reason in terms of Friedman (1968) [12] that borrowing cause higher interest rates and financial crowing out while fiscal expansion cause inflation. The writer while in support of Keynes fiscal theory is also of the mindset that if fiscal theory is properly applied it will achieve its expected goal particularly in the periods of economic shocks.

### Endogenous growth theory

Romer (1986) [28] growth theory known as endogenous growth theory was modified by Lucas in (1988) [18]. By this theory it is the internal forces of an economy that determines economic growth and that investment in human capital, innovation, cum knowledge are positively significant to economic growth. In support of this analysis are Rebelo (1991) [27] and Barry (1996) [8] who developed a two-section endogenous growth model using a model of energy prices. In addition are the Schumpeterian innovational based growth theory developed by Grossman and Helpman (1991) [13] and Aghion and Howitt (1992) [14]. Emphatically stated, the Schumpeterian analysis focuses on the improvement of quality innovations which relinquishes older products for quality improvements. The Schumpeterian analysis is called the “creative destruction”. However, Domar (1946) [10] and Solow (1956) [30] study takes an aversion to that of Schumpeter (1942) [29] stating that growth is exogenously or externally determined. However, this study is of the view that internal technological awareness can also create way for sustainable growth.

### The Laffer curve Theory

The laffer curve theory explains the theoretical representation of the relation between government revenue raised by taxation and all possible rates of taxation. The theory propounded by Laffer (1974) postulates that tax revenue is not raised at the extreme rates of zero and hundred percent. And that there must be at least a rate which maximizes government taxation revenue. The theory is captured with the demonstration of Laffer curve which considers the amount of tax revenue raised at the extreme of zero and hundred percent. The theory is of the view that a hundred percent tax rate raises no revenue in the same way that a zero percent tax rate raises no revenue. The fact that with a hundred percent rate there is no more incentive for a rational tax payer to earn ay income, the revenue accrued is one hundred percent and nothing. The argument follows that there must be a rate between a Point where tax revenue must be maximum in this regard, Laffer curve represent the relationship among the rates of taxation and an expectant levels of government revenue based on an optimal tax rate which maximizes total government tax revenue. The schools of thought of this theory include Keyserling (1979) [15], Alfred (1988) [5] and Stightz (2009). They are all of the interest that Laffer curve analysis explains the concept of taxable income elasticity showing taxation income in response to change in the rate of taxation.

## Empirical Literature

Aaron and Thomas (2005) in there study socio-economic development and fiscal policy introduced a socio-economic development in tax and investigated the relationship between various fiscal variables. Using panel model approach capturating net lending and public debt of government in countries like Greece, Portugal, Spain and Ireland the study stated that improvement in net lending position of government and fall in the level of public debt is beneficial to economic development in the medium term. In furtherance of the analysis, it stated that fiscal consolidation is found to be more relevant in the promotion of socio-economic development especially in the EU-15 member states. Amanja and Morrissey (2005) [6] carried out a study

on the relationship between fiscal policy and growth within a review period of 1964 to 2002. Using autoregressive distributed lag (ARDL) and ordinary least square models, the study reveals that unproductive expenditure has strong adverse impact on growth and that there is no evidence of distortionary effects on growth with regards to distortionary taxes. The study thus recommend that expenditure and tax policies boost public investment by reducing unproductive expenditures. Smitogun and Ajinla (2007) carried out a study on fiscal policy effect on Nigeria's economic growth. The study captured economic growth using the variables of fiscal policy ratio, debt finance and money printing finances between 1980 and 2005. The result indicates that fiscal activities by the government do not promote sustained and indicative growth.. Rather it invalidates the theoretical facts by Keynes, such that corruption, wasteful spending, policy inconsistency, uncontrolled money supply, poor policy implementation etc impact negatively on the economy. The best, the study recommended is fiscal prudence cum seriousness by the government. Adefeso (2010) [3] studied the impact of fiscal policy on economic growth in Nigeria between 1970 and 2005. Using error correction model the study reveals that productive government expenditure has effect on economic growth and therefore concludes that government expenditure encourages economic growth and the execution of productive expenditures. Modebe (2012) [21] carried out a study on the impact of recurrent and capital expenditures on Nigeria's economic growth between 1987 and 2010. Using multiple regression, the study shows that both capital and recurrent expenditures are statistical insignificant, though the impact of recurrent being positive and that of capital negative. The study thus concludes that they can be relied upon as the diagnostic statistic proves the estimated model to be invalid. It is therefore advisable that both capital and recurrent expenditure be improved to be economic driven. Bouakez, Chihi and Normandin (2014) [19] carried out an econometric analysis on the effects of fiscal policy tools on the economy of United States of America in the late seventies and the early eighties. Their study revealed that public spending impacts more on economic growth and taxation. The study concluded that increases in public spending are more effective than tax cuts in stimulating economic growth and therefore recommended that the rise of government expenditure as a fiscal instrument to increase growth is a priority to the growth of the economy. Omodero, Ihendinihi, Ewke, and Azubuike (2016) [25] carried out an empirical study stating; "the impact of fiscal policy on the Nigerian economy between 1994 and 2014. Using multiple regression estimation the study revealed that there is no significant relationship between capital expenditure, recurrent expenditure, tax revenue and real gross domestic product. The study concluded that government need to promote the growth of GDP in the economy. Miftahu, Rosni and Tunku (2018) [20] studied the effects of fiscal operations on economic growth and stability in Nigeria. The study was carried out with an estimated model adopting ARDL model with subdivision of baseline and alternative models. The former measured the effects of economic growth while alternative model accounted for effects of economic stability within the periods of 1996 and 2016. The results show that fiscal operations lead to economic growth according to the baseline model while same fiscal operations also lead to economic stability by the alternative method. Recommendation of the study ensures the need for government to improve in its spending and at the same time apply appropriate tax regime to achieve economic growth and stability. Mohamed (2019) [22] carried out a study on the equilibrium relationships and dynamic causality between economic growth and fiscal policy tools in Jordan between 1978 and 2017. The study was carried out using autoregressive distributed lag and vector error corrections model. The results indicated that there is causal relationships and co-integration between economic growth and fiscal policy instruments. That government expenditure impact on economic growth in the long-run and that total tax rates have long-run negative impacts.

**Methodology of the Study**

Quasi-experimental design is employed incorporating dependent and independent variables between 1984 and 2020 for in econometric analysis. In this regard regression analysis is employed using time series data. This work is estimated using three equation models as:

1. Read Gross Domestic Product Growth Rate ($RGDP_{rt}$)
2. Inflation Rate ($Inf_t$) and
3. Unemployment Rate ($Unpt_{rt}$) as dependent variables which capture some independent variables of personal income tax, company income tax, value added tax, government expenditure on health and government expenditure on educational institutions. Hence their specifications.

$$RGDP_{rt} = f\ (PIT, CIT, VAT, GEE, GEH) \quad 1$$

$$Int_{rt} = f\ (PIT, CIT, VAT, GEE, GEH) \quad 2$$

$$Unpt_{rt} = f\ (PIT, CIT, VAT, GEE, GEH) \quad 3$$

In economictric model;

$$RGDP_{rt} = \sum_0 + \sum_1, PIT + \sum_2, CIT + \sum_3, VAT + \sum_4, GEE + \sum_5, GEH + + \mu_{t4} \quad 4$$

$$Inf_{rt} = \pi_0 + \pi_1, PIT + \pi_2, CIT + \pi_3, VAT + \pi_4, GEE + \pi_5, GEH + + \mu_{t5} \quad 5$$

$$Unpt_{rt} = \alpha_0 + \alpha_1, PIT + \alpha_2, CIT + \alpha_3, VAT + \alpha_4, GEE + \alpha_5, GEH + + \mu_{t6} \quad 6$$

Where, $+ \mu_{4\text{-}6}$ are residual terms

Hence the apriori conditions for;

$RGDP_{rt}$ and $Int_{rt}$

$\sum_1, \sum_2, \sum_3, < 0: \sum_4, \sum_{5,} > 0$

$\pi_1, \pi_2, \pi_3, < 0: \pi_4, \pi_{5,} > 0$

For $Unpt_{rt}$

$\alpha_1, \alpha_2, \alpha_3, > 0: \alpha_4, \alpha_{5,} < 0$

**$Unpt_{rt}$ Root Test**

The unit not test is used to determine whether time series data are stationary to avoid spurious results. This justification through the use of the ordinary least square estimation is based on the "best linear unbiased estimate" Blue. So, the outcome of the unit root test justifies the test for cointegration hence ARDL cointegration test for predicting RGDP and Johansen – Juselius co-integration test for $Int_{rt}$ and $Unpt_{rt}$ respectively. They are all based on the application of error correction mechanism based on OLS estimation.

**Cointegration Test**

Unit roots test leads to cointegration, the reason that cointegration tries to model non-stationary time series variables (Iyelli, 2010). That even if two time series data may not themselves be stationary, a linear combination of the two non-stationary time series may be stationary. As this accurs, the two original non-stationary time series are said to be cointegrated. If the two time series are of the same order after same number of differencing of "order I" then Johansen co-integration test can be applied. In the other way, if the two time series are of levels at 1st difference, then ARDL cointegration test is applicable. This study adopts ARDL cointegration test for the initial model for $RGDP_{rt}$ and Johansen – Jeselius co-integration test for the second and third models for $Inf_{rt}$ and $Unpt_{rt}$. In addition is to determine short-run dynamic process leading to long-run dynamic equilibrium. This is an attempt to integrate economic theory for a long-run equilibrium. This can be achieved through error correction mechanism. Error correction is a one period lagged value for the residual from a static model. The approach here is to assume a lagged dependent variable and a single lag on the independent variables. Hence;

$$\Delta Y_t = a_0 + a_0 \Delta Y_{t-1} + a_2 \Delta X_{t-1} + - \quad - + \Phi E_{t-1} - 7$$

Where D = first difference

Φ = speed of adjustment indicating how the system returns to equilibrium after shock

E = Error correction mechanism

By right this is expected to be less than 1 or negative for a model to attain equilibrium.

**Presentation, Analysis and Discussion of Findings**

This study shows data for analysis at the appendix. However, unit root test is conducted as indicated under methodology, using augmented Dickey Fuller (ADF) and Philip Peron (P-P) tested at both level and first difference of the series. As it is, all the variables are stationary at 1st difference except $RGDP_{rt}$ at the instances of the ADF and P-P which claim different levels of integration. Since it is stationary at level it is not required for differencing. The reason that the probability value is less than 5 percent (5%) significant level in both the ADF and Philip Peron (P-P) result. Since all the variables are integrated of the same order except $RGDP_{rt}$, then Johansen cointegration can be used for $Inf_{rt}$ and $Unpt_{rt}$. And also, that a bound test is necessary to examine the existence of cointegration since the other variables are stationary at first difference $Inf_{rt}$ and $Unpt_{rt}$ using ARDL model.

**Table 1:** Unit root test result

| Variable | ADF | | Order of Integration | PP | | Order of Integration |
|---|---|---|---|---|---|---|
| | Level | 1st Difference | | Level | 1st Difference | |
| $RGDP_{rt}$ | -5.031539 (0.0012) | - | 1(0) | -5.052347 (0.0012) | - | 1 (0) |
| $Inf_{rt}$ | -3.165210 (0.1099) | -5.638643 (-0.0002) | 1(1) | -2.873261 (0.1823) | -6.642975 (0.0000) | 1(1) |
| $Unpt_{rt}$ | -0.668961 (0.9651) | 4.916896 (0.0017) | 1(1) | -0.748568 (0.9614) | -4.784045 (0.0025) | 1(1) |
| PitS | -1.043637 (0.9250) | -6.511319 (0.0000) | 1(1) | -0.986185 (0.9338) | -6.527625 (0.0000) | 1(1) |
| CIt | -1.999780 (0.5823) | -6.126283 (0.0001) | 1(1) | -2.063737 (0.5482) | -6.185442 (0.0001) | 1(1) |
| VAT | -1.660750 (0.7484) | 5.959081 (0.0001) | 1(1) | -1.710646 (0.7264) | -5.959477 (0.0001) | 1(1) |
| GEE | -2.677878 (0.2510) | -5.311261 (0.0007) | 1(1) | -2.671576 (0.2534) | -13.99482 (0.0000) | 1(1) |
| GEH | -0.184848 (0.9907) | -4.518593 (0.0054) | 1(1) | -3.081520 (0.1255) | -10.20544 (0.0000) | 1(1) |

Note p-value in parenthesis.

**Source:** Authors E-view 10 computation

**Table 2:** Bound test result (First model predicting $RGDP_{rt}$)

| F-Bounds Test Null Hypothesis: No levels relationship | | | | |
|---|---|---|---|---|
| Test Statistic | Value | Signif. | I(0) | I (0) |
| | | | Asymptotic: n=1000 | |
| F-statistic | 3.956721 | 10% | 2.26 | 3.35 |
| K | 5 | 5% | 2.26 | 3.79 |
| | | 2.5% | 2.96 | 4.18 |
| | | 1% | 3.41 | 4.68 |
| | | | Finite Sample | |
| Actual Sample Size | 36 | | n=40 | |
| | | 10% | 2.482 | 3.708 |
| | | 5% | 2.962 | 4.338 |
| | | 1% | 4.045 | 5.898 |
| | | | Finite Sample: n = 35 | |
| | | 10% | 2.508 | 3.763 |
| | | 5% | 3.037 | 4.443 |
| | | 1% | 4.257 | 6.04 |
| T-Bounds Test | | Null Hypothesis: No levels relationship | | |
| Test Statistic | Value | Signif. I(0) | | I(1) |
| t-statistic | -4.289340 | 10% -2.57 | | -3.86 |
| | | 5% -2.86 | | -4.19 |
| | | 2.5% -3.13 | | -4.46 |
| | | 1% -3.43 | | -4.79 |

From the bound result on table there exists a cointegrating equation at 5 percent significance

Level the reason that f-statistic value of 3.9567321 is greater than (1) bound value of 3.79 at 5 percent level of significance. Also the T-statistic value of – 4.289340 is greater than the 1 (1) bound value of -4.19 at 5 percent level of significance. Therefore the null hypothesis of no levels relationship or cointegration equation is rejected. This is the justification for the estimation of the short-run dynamics using error correction under the ARDL model.

**Table 3:** Johansen- Juselius co-integration test model predicting $Inf_{rt}$.

| **Unrestricted Cointegration Rank Test (Trace)** | | | | |
|---|---|---|---|---|
| **Hypothesized** | | **Trace** | **0.05** | |
| **No. of CE(s)** | **Eigenvalue** | **Statistic** | **Critical Value** | **Prob**** |
| None * | 0.852199 | 207.7915 | 95.75366 | 0.0000 |
| At most 1 * | 0.810168 | 148.5229 | 69.81889 | 0.0000 |
| At most 2 * | 0.777830 | 97.01278 | 47.85613 | 0.0000 |
| At most 3 * | 0.655448 | 50.37914 | 29.79707 | 0.0001 |
| At most 4 * | 0.302511 | 17.34833 | 15.49472 | 0.0260 |
| At most 5 * | 0.180741 | 6.179986 | 3.841466 | 0.0129 |
| Trace test indicates 6 cointegrating eqn (s) at the 0.05 level<br>* denotes rejection of the hypothesis at the 0.05 level<br>** MacKinnon-Haug-Michelis (1999) p-values | | | | |
| Unrestricted Cointegration Rank Test (Maximum Eigenvalue) | | | | |
| Hypothesized | | Max-Eigen | 0.05 | |
| No.of CE(s) | Eigenvalue | Statistic | Critical Value | Prob** |
| None * | 0.852199 | 59.26859 | 40.07757 | 0.0001 |
| At most 1 * | 0.810168 | 51.51015 | 33.87687 | 0.0002 |
| At most 2 * | 0.777830 | 46.63364 | 27.58434 | 0.0001 |
| At most 3 * | 0.655448 | 33.03081 | 21.13162 | 0.0007 |
| At most 4 * | 0.302511 | 11.16835 | 14.26460 | 0.1460 |
| At most 5 * | 0.180741 | 6.179986 | 3.841466 | 0.0129 |
| Max-cigenvalue test indicate 4 cointegrating eqn(s) at the 0.05 level<br>* denotes rejection of the hypothesis at the 0.05 level<br>** MacKinnon-Haug-Michelis (1999) p-values | | | | |

Based on table 4.3, it is shown that there exist six co-integrating equations at 5 percent level of significance and that there exists long-run equilibrium relationship between the variables. The maximum Eigen value indicates that there is also a long-run equilibrium relationship between the variables of the model.

**Table 4:** Johansen – Juselius co-integration predicting $Unpt_{rt}$

| **Unrestricted Cointegration Rank Test (Trace)** | | | | |
|---|---|---|---|---|
| Hypothesized | | Trace | 0.05 | |
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob** |
| None * | 0.742143 | 138.0562 | 95.75366 | 0.0000 |
| At most 1 * | 0.615458 | 90.61890 | 69.81889 | 0.0005 |
| At most 2 * | 0.529507 | 57.16929 | 47.85613 | 0.0052 |
| At most 3 * | 0.432181 | 30.78018 | 29.79707 | 0.0384 |
| At most 4 * | 0.269100 | 10.97182 | 15.49471 | 0.2132 |
| At most 5 * | 1.31E-06 | 4.60E-05 | 3.841466 | 0.9962 |
| Trace test indicates 4 cointegrating eqn (s) at the 0.05 level<br>* denotes rejection of the hypothesis at the 0.05 level<br>** MacKinnon-Haug-Michelis (1999) p-values | | | | |
| Unrestricted Cointegration Rank Test (Maximum Eigenvalue) | | | | |
| Hypothesized | | Max-Eigen | 0.05 | |
| No.of CE(s) | Eigenvalue | Statistic | Critical Value | Prob** |
| None * | 0.642143 | 47.43728 | 40.07757 | 0.0062 |
| At most 1 * | 0.615458 | 33.44961 | 33.87687 | 0.0561 |
| At most 2 * | 0.529507 | 26.38912 | 27.58434 | 0.0705 |
| At most 3 * | 0.432181 | 19.80836 | 21.13162 | 0.0757 |
| At most 4 * | 0.269100 | 11.97177 | 14.26460 | 0.1556 |
| At most 5 * | 1.31E-06 | 4.60E-05 | 3.841466 | 0.9962 |
| Max-cigenvalue test indicate 1 cointegrating eqn(s) at the 0.05 level<br>* denotes rejection of the hypothesis at the 0.05 level<br>** MacKinnon-Haug-Michelis (1999) p-values | | | | |

Based on the cointegrating test result the trace statistic indicates a four co-integrating equations at 5 percent level of significance. This indicates there is a long-run equilibrium relationship between the variables used in the models. Also, on the maximum Eigen statistic the result indicates that there is one cointegrating equation at 5 percent, level of significance. Thus, there is a long-run relationship between the variables in the models.

**Table 5:** Error Correction Model $RGDP_{rt}$

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -0.162017 | 0.522600 | -0.310020 | 0.7611 |
| D(RGDPR(-1)) | 0.315108 | 0.148064 | 2.128196 | 0.0516 |
| D(RGDPR(-2)) | -0.407379 | 0.128697 | -3.165411 | 0.0069 |
| D(RGDPR(-3)) | 0.091956 | 0.147984 | 0.621391 | 0.5443 |
| D(PITR(-1)) | -0.224780 | 0.139430 | -1.612131 | 0.1292 |
| D(PITR(-2)) | -0.337487 | 0.146545 | -2.302958 | 0.0371 |
| D(PITR(-3)) | 0.123105 | 0.195376 | 0.630091 | 0.5388 |
| D(CITR(-1)) | 0.018286 | 0.227669 | 0.080320 | 0.9371 |
| D(CITR(-2)) | -0.528874 | 0.240625 | -2.197917 | 0.0453 |
| D(CITR(-3)) | -0.425634 | 0.233441 | -1.823303 | 0.0897 |
| D(VATR(-1)) | 1.590595 | 1.116470 | 1.424664 | 0.1762 |
| D(VATR(-2)) | -0.827513 | 0.488048 | -1.695555 | 0.1121 |
| D(VATR(-3)) | 1.067938 | 0.540210 | 1.976896 | 0.0681 |
| D(LGEE(-1)) | 2.998866 | 1.924293 | 1.558425 | 0.1414 |
| D(LGEE(-2)) | 0.096516 | 1.927674 | 0.050068 | 0.9608 |
| D(LGEE(-3)) | 3.587516 | 1.834330 | 1.955763 | 0.0708 |
| D(LGEH(-1)) | 4.620918 | 1.991418 | 2.320417 | 0.0359 |
| D(LGEH(-2)) | 2.812690 | 2.026937 | 1.387656 | 0.1869 |
| D(LGEH(-3)) | 5.751738 | 1.646218 | 3.493910 | 0.0036 |
| $ECT_1$(-l) | -0.964144 | 0.278870 | -3.457328 | 0.0038 |
| R-squared | 0.898575 | Mean dependent var | | 0.198235 |
| Adjusted R-squared | 0.760926 | S.D. dependent var/* | | 4.153142 |
| S,E of regression | 2.030687 | Akaike info criter[5]on | | 4.543793 |
| Sum squared resid | 57.73167 | Schwarz criterion | | 5.441652 |
| log likelihood | -57.24448 | Hannan-Quinn criter. | | 4.849989 |
| F-statistic | 6.528029 | Durbin-Watson stat | | 2.408772 |
| Prob(F-statistic) | 0.000435 | | | |

**Source:** Author's computation, using E-views 10.

$$RGDP_{rt} = \underset{(0.7611)}{0.16} + \underset{(0.0516)}{0.31}DRGDPrt(-1) \underset{(0.0009)}{-0.407}DRGDPrt(-2) + \underset{(0.5443)}{0.9}DRGDPrt(-3) \underset{(0.1292)}{-0.22}PIt$$

$$\underset{(0.0359)}{+4.6}DLGEH(-1) \underset{(0.1869)}{+2.81}DLGEH(-2) \underset{(0.0036)}{+5.75}DLGEH(-3) + \underset{(0.0038)}{0.965}ECT(-1)$$

$$\underset{(0.0371)}{+0.3}DPIt(-2) + \underset{(0.5388)}{0.123}DPit(-3) + \underset{(0.9371)}{0.018}DCIt(-1) - \underset{(0.0453)}{0.5}DCIt(-2) \underset{(0.897)}{-0.4}DCIt(-3) \underset{(0.1762)}{+1.59}DVAt(-1)$$

$$\underset{(0.1121)}{-0.8}DVAT(-2) \underset{(0.0681)}{+1.0679}DVAT(-3) \underset{(0.1414)}{+2.99886}DLGEE(-1) + \underset{(0.9608)}{0.0965}DLGEE(-2) \underset{(0.0708)}{+3.5875}DLGEE(-3)$$

R-squared = 0.898575
Adjusted R-squared = 0.760926
Prob. (f-statistic) = (0.000435)
DW = 2.408772
Note: Probability values in parenthesis

**Table 6:** Parsimonious Error Correction Estimate for inflation model

| Variable | Coefficient | Std. Error t-Statistic | Prob. |
|---|---|---|---|
| C | -0.406663 | 2.445233 -0.166308 | 0.8700 |
| D(PITR) | -1.063573 | 0.470921 -2.258494 | 0.0382 |
| D(CITR) | -0.038961 | 1.164676 -0.033452 | 0.9737 |
| D(VATR) | 4.891127 | 4.713211 1.037748 | 0.3148 |
| D(LGEE) | -4.545016 | 9.178320 -0.495190 | 0.6272 |
| D(LGEH) | -0.663956 | 9.340704 -0.071082 | 0.9442 |
| D(CITR(-1)) | -2.297758 | 1.074244 -2.138955 | 0.0482 |
| D(VATR(-1)) | -6.229254 | 2.888441 -2.156615 | 0.0466 |
| D(LGEE(-1)) | -16.54774 | 9.234911 -1.791868 | 0.0921 |
| D(PITR(-2)) | -1.094964 | 0.845154 -1.295579 | 0.2135 |
| D(CITR(-2)) | 0.965753 | 1.057342 0.913378 | 0.3746 |
| D(LGEE(-2)) | -5.561198 | 6.444450 -0.862944 | 0.4009 |
| D(LGEH(-2)) | -5.307693 | 5.772212 -0.919525 | 0.3715 |
| $ECT_2$(-1) | -0.445023 | 0.204403 -2.177183 | 0.0448 |
| R-squared | 0.824305 | Mean dependent var | -0.478788 |
| Adjusted R-squared | 0.648610 | S.D. dependent var | 15.01205 |
| S.E. of regression | 8.898870 | Akaike info criterion | 7.516110 |
| Sum squared resid | 1267.038 | Schwarz criterion | 8.287038 |
| Log likelihood | -107.0158 | Hannan-Quinn criter. | 7.775504 |
| F-statistic | 4.691680 | Durbin-Watson stat | 1.536998 |
| Prob(F-statistic) | 0.001797 | | |

**Source:** Author's computation, using E-views 10.

The regression result for the above is:

$$Inf_{rt} = \underset{(0.8700)}{-0.4} \underset{(0.0382)}{-1.063DPIt} \underset{(0.9737)}{-0.03DCIt} \underset{(0.3148)}{+4.89DVAT} \underset{(0.6272)}{-4.9545DLGEE} \underset{(0.9442)}{-0.66DLGEE} \underset{(0.0482)}{-2.297758CIT(-1)}$$

$$\underset{(0.0466)}{6.2DVAT} \underset{(0.4009)}{+5.56DLGEE(-2)} \underset{(0.3715)}{-5.30DLGEH} \underset{(0.0448)}{-0.445ECT2(-1)}$$

R-squared = 0.824305
Adjusted R-squared = 0.648610
Prob (f-statistic) = (0.001797)
DW = 1.536998
Note: Probability values in parentheses

**Table 7:** Regression Table for $_{UnPtrt}$

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.046093 | 0.773258 | 0.059609 | 0.9534 |
| D(PITR) | 0.333641 | 0.148817 | 2.241950 | 0.0446 |
| D(CITR) | -0.325441 | 0.317307 | -1.025634 | 0.3253 |
| D(LGEE) | 1.791562 | 3.045380 | 0.588289 | 0.5672 |
| D(LGEH) | 0.162643 | 2.965789 | 0.054840 | 0.9572 |
| D(PITR(-1)) | 0.384678 | 0.169564 | 2.268627 | 0.0425 |
| D(VATR(-1)) | 3.765180 | 1.836120 | 2.050618 | 0.0628 |
| D(LGEE(-1)) | 1.584986 | 3.221085 | 0.492066 | 0.6316 |
| D(PITR(-2)) | -0.176914 | 0.324449 | -0.545275 | 0.5956 |
| D(CITR(-2)) | -0.097171 | 0.328063 | -0.296195 | 0.7721 |
| D(VATR(-2)) | 1.621789 | 0.676621 ' | 2.396895 | 0.0337 |
| D(PITR(-3)) | 0.566498 | 0.312889 | 1.810538 | 0.0953 |
| D(CITR(-3)) | -0.641917 | 0.309887 | -2.071457 | 0.0605 |
| D(VATR(-3)) | 0.401284 | 0.698673 | 0.574351 | 0.5763 |
| D(LGEE(-3)) | 2.369271 | 2.825546 | 0.838518 | 0.4181 |
| D(LGEH(-3)) | -3.709711 | 1.928854 | -1.923272 | 0.0785 |
| $ECT_3$(-1) | -0.475431 | 0.255982 | -1.857279 | 0.0480 |
| R-squared | 0.860200 | Mean dependent var | | 0.198235 |
| Adjusted R-squared | 0.615551 | S.D. dependent var | | 4.153142 |
| S.E. of regression | 2.575114 | Akaike info criterion | | 4.982328 |
| Sum squared resid | 79.57452 | Schwarz criterion | | 5.969973 |
| Log likelihood | -62.69958 | Hannan-Quinn criter. | | 5.319143 |
| F-statistic | 3.516050 | Durbin-Watson stat | | 2.225849 |
| Prob(F-statistic) | 0.014359 | | | |

**Source:** Author's computation, using E-views 10.

The regression result for this model given below

$$Inf_{rt} = \underset{(0.9534)}{0.04\,6} \underset{(0.0465)}{+0.33DPIt} \underset{(0.3253)}{-0.325DCIt} \underset{(0.5672)}{+1.79DLGEE} \underset{(0.9572)}{+0.160DLGEEH} \underset{(0.0425)}{+0.38PIT} \underset{(0.0337)}{+1.620DVAT(-2)}$$

$$\underset{(0.0605)}{0.64DCIT} \underset{(0.4181)}{+2.369DLGEE(-3)} \underset{(0.0785)}{-3.7DLGEH\,(-3)} \underset{(0.0480)}{-0.475ECT3(-1)}$$

R-squared = 0.860200
Adjusted R-squared = 0.61551
Prob (f-statistic) = (0.014359)
DW = 2.22589
Note: Probability values in parentheses.

**Analysis of the study**

**The $RGDP_{rt}$ Model**

The consideration of the analysis on table 4.5 indicates that the explanatory variable explains 76 percent variation in $RGDP_{rt}$. At the same time the Dubin-Watson statistics shows a 2.4 indicating the absence of auto-correlation. The model is well fitted by the show of F-Statistic probability of 0.000435. Because the ECT is – 0.964144, the model is appropriately signed and is statistically significant but indicates an adjustment process of about 96 percent. And also, that $RGDP_{rt}$ at period (2) indicates a negative coefficient of -0.407379 and probability value of 0.0069 showing a statistically significant level at 5 percent. While percentage increase in $RGDP_{rt}$ at period (2) is 0.4 percent fall in $RGDP_{rt}$ in the current year, Pit of the lag period (2) indicates a negative coefficient of – 0.337387 and a probability value of 0.0371 showing that they are statistically significant at 5 percent. In the case of CIT the lag period (2) indicates a negative coefficient of – 0.528874 with a probability value of 0.453 which reveals a statistical significance at 5 percent level. This implies that there is a percentage increase of 0.5 percent of CIT that lowers $RGDP_{rt}$. Meanwhile government expenditure on health GEH of lag period (1) and (3) indicate positive coefficient of 0.4620918 and 5.751738 with probability value of 0.0359 and 0.0036 respectively. Percentage increase in GEH of (1) and (3) periods lead to a fall in $RGDP_{rt}$ by 0.4 and 5.7 GEE and VAT are variously statistically insignificant at 5 percent level of significance indicating they do not influence $RGDP_{rt.}$

**The $Inf_{rt}$ Model**

In table 4.6 above the explanatory variables explain about 65 percent of the variation of $Inf_{rt}$ in the analysis of the study. With Durbin-Wastin statistics of 1.5 the minimal level of autocorrelation, the f-statistics probability value is 4.69. The value of ECT is – 0.445023 showing an appropriate sign and is statistically significant. It however, shows a slow adjustment process of about 45 percent. A negative co-efficient of – 1.063573 and a probability value of 0.0382 shows Pit as being statistically significant at 5 percent level of significance. However, a percent increase in Pit lowers inflation rate in $Inf_{rt}$ by 1.06 percent. In addition, a company income tax rate CIT indicates a negative co-efficient of – 2.297758 and a probability value of 0.0482 showing a statistical significance at 5 percent level. A percentage increase in CIT in lag period (1) leads to a fall in $Inf_{rt}$ by 2.29 percent. Also, a value added tax of lag period (1) indicates a negative coefficient of – 6.229254 and probability value of 0.0466 indicating statistical significance at 5 percentage increase in VAT which lowers $Inf_{rt}$ by 6.2 percent. However, both government expenditure on education (GEE) and health (GEH) are statistically insignificant meaning they do not influence $Inf_{rt.}$

**$Unpt_{rt}$**

Table 4.7 shows the explanatory variable which explains 86 percent variable between it and $Unpt_{rt.}$ Others are that Durbin-Watson statistic 2.2 which indicates the absence of autocorrelation and f-statistic probability of 0.014359 indicating the specification of the model. The $ECT_3$ value is – 0.475431 indicating an appropriate sign. In addition, the study is statistical significance and ensures a slow adjustment process of about 48 percent. The positive coefficient of 0.333641 and the probability value of 0.0446 of PIt of current year is a manifestation of the statistical significance of the variable at 5 percent level. And a percentage increase in Pit aids the increase in unemployment rate ($Unpt_{rt}$) of about 0.3 percent. And also, that (PIt) of lag period (1) has positive coefficient of 0.384678 with a probability value of 0.0424 which shows that the study is statistically significant at 5 percent level of significance. Furthermore, (VAT) of lag period (2) indicates a positive coefficient of 1.621789 with a productivity value

of 0.0337 implying that their relationship is statistically significant at 5 percent level of significance. In this regard a percentage increase in (VAT) leads to increase in ($Unpt_{rt}$) by 1.6 percent.

**Discussion of Findings**

The empirical findings in this study is the interrelation behaviour as indicated on the table of regression and hence their performances. Those are subjects of the empirical investigations as they are presented below;

In the model of real gross domestic product rate, the study reveals a negative existence and signalificant relationship between personal income tax rate ($Pit_{rt}$) and $RGDP_{rt}$. This shows that the increase in PITrt lowers productivity. Also, (GEH) and $RGDP_{rt}$ are positively correlated as (GEH) cause $RGDP_{rt}$ to increase implying healthier productive workforce in the economy. Hence government expenditure enhances the growth of the economy.

Referring to the second model ($Inf_{rt}$), it is revealed that a significant and negative relationship exist between (CIT) and ($Inf_{rt}$) in Nigeria. That all things being equal, increase in company income tax lowers inflation. The reason that as cost of production increases due to increases in company income tax, cost of goods and services increase and further lowers demand ensuring a consequence on the rate of inflation.

The next discussion is on unemployment rate in relationship with the aforementioned explanatory variables. Findings, here, indicates value added tax (VAT) has a positive and significant effect on unemployment rate ($Unpt_{rt}$) in Nigeria. It shows that (VAT) and $Unpt_{rt}$ are positively correlated because of the rise in unemployment rate through the income effect on (VAT). The interconnectivity of this tendency causes increase in (VAT) which increase the prices of goods and services which in turn reduce income and lowers demand. A lowered demand causes lowered economic activities and consequent rise in unemployment in the country.

**Summary, conclusion and recommendation**

**Summary**

The study shows that increases in $RGDP_{rt}$ of lag (2) period causes a fall in the recurrent year. And that this increase due to $RGDP_{rt}$ of lag (2) which is due to economic activity, is because of the increase in inflation. This further pushes the real gross domestic product of the current year to drop, the fact that, with an increase in inflation rate the purchasing power of money in the economy must drop. Secondly that, outcome of the analysis indicates a negative significant correlation between personal income tax rate (PIT) of lag (2) and real gross domestic product growth rate ($RGDP_{rt}$) in PIT leading to decrease in disposable income which affect demand negatively, hence the reduction of the rate of real gross domestic product in the country: Other relationships between the variable are as shown in the above discussion through the analysis of the study.

**Conclusion**

This study specifically examines fiscal policy and economic behaviours in Nigeria between 1981 and 2020. Using an error correction model to determine the study personal income tax rate, company income tax rate, value added tax rate, government expenditure on health and education are used to capture the relationship between the variables and growth rate of real gross domestic product. The result of these relationships in the various levels of econometric test are treated with outcomes prescribed in the analysis of the study.

The study reveals that personal income tax rate and company income tax impacts negatively on real gross domestic product rate. Government expenditure on health impacts positively in the rate of real gross domestic product. Also that the rates of personal income tax, company income tax and value added and the result of government expenditure on education has no significant impact on any of the dependent variables of real gross domestic product, rate of inflation and the rate of unemployment in capturing economic behaviours in the country. The study therefore, is of the view that government (s) expand the tax base for more of the population and corporate institutions into the tax net while tax rates are lowered so as to create better environment by which tax revenue can be enhanced through tax compliance.

**Recommendation**

Based on the findings from the study some policy recommendation is hereby made below for improvement of fiscal policy on economic behaviours in Nigeria. Therefore:

- Government needs to monitor her expenditure behaviour on education to achieve significant result in the sector.
- That the tax base needs to be expanded including individuals and companies in to the tax net which will encourage increased revenue and at the same time lower the tax rate for payers to comply favourably to tax payments.
- Value added tax rate should be minimized to encourage aggregate demand. This can encourage a fall in the rate of unemployment while making way for variety of substitute goods and services to check inflationary pressure that may occur.
- To enhance aggregated demand, there is need for government to reduce company income tax rate.

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