

FISCAL DECENTRALIZATION AND MACROECONOMIC STABILITY IN NIGERIA

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ABSTRACT

Given the benefits of fiscal decentralization and the drive among developing and transition countries including Nigeria to decentralize their expenditures and revenues to sub-national government as part of a broader objective for enhancing public sector efficiency, this study examined fiscal decentralization and macroeconomic stability in Nigeria. The Vector Autoregressive (VAR) model is used along with Johanson's Vector Error Correction Model (VECM) for the empirics. The co-integration results revealed that, the maximum Eigenvalue statistic confirmed the existence of co-integrating equations among the variables of interest. This suggested the tendency of a long run relationship among the variables under consideration. The VAR result indicated that the one lagged period of macroeconomic variable is not a driver of economic growth as its coefficient exhibits negative values and is not statistically significant. The VECM result indicated that there will be long run relation among the variables under consideration. The empirical result went further to show that, fiscal decentralization has not encouraged macroeconomic stability that has significantly led to economic growth in Nigeria. The study therefore recommends the need for practical devolution of fiscal responsibility especially in the areas of revenue assignment.

Keywords: Co-integration, Economic growth, Expenditure, Fiscal decentralization, Macroeconomic stability, Revenue

1. Introduction

Fiscal decentralization has been a recurring issue as it has been embarked upon for over two decades by both developing and transitional economies. Fiscal decentralization is the process of reassigning expenditure functions and revenue sources to sub-national governments with a view to decentralizing fiscal policy making and implementation across various governance levels. One of the strongest arguments in favour of decentralization is based on the premise that it allows a closer match between the preferences of the population and the bundle of public goods and services.

The Nigerian economy is experiencing macroeconomic stability crises as the economy is suffering from a high inflation rate, a high unemployment rate, and high fiscal and current account deficits. Macroeconomic stability can be considered as a situation where an economy is able to minimize its vulnerability to the impact of shocks (internal or external). Macroeconomic stability is said to exist when key economic relationships are in balance particularly between domestic demand and output, the balance of payments, fiscal revenues and expenditure, and savings and investment. Macroeconomic stability in the context of this study is when there is a balance in fiscal revenue and expenditure within the sub-national governments such that these macroeconomic variables in terms of inflation and unemployment are low. Despite the widening appeal of fiscal

decentralization, it remains controversial regarding its benefits on promoting economic growth through macroeconomic stability. A number of studies question the validity of the positive impact of fiscal decentralization on economic growth, and suggest that fiscal decentralization may even be detrimental to the overall macro economic performance of a country (Amagoh and Amin, 2012). Given the benefits of fiscal decentralization it is important to ask not only whether fiscal decentralization influences economic growth, but also how fiscal decentralization influences economic growth through macroeconomic stability. This puzzle can be resolved through an empirical analysis of the relationship between fiscal decentralization and macroeconomic stability. This paper is organized into six sections. The next section reviews the relevant literature while section three is the methodology. Section four discusses the empirical results and section five concludes the paper.

2. Literature Review

2.1 Theoretical Literature

2.1.1 Tiebout's Model

The Tiebout model discusses the relationship among intercommunity mobility, voluntary community formation and efficient provision of public goods. The Tiebout (1956) hypothesis “asserts that in economic situation where it is optimal to have many jurisdictions offering competing packages of public goods, the movement of consumers to jurisdictions where their wants are best satisfied and competition between jurisdictions for residents will lead to optimal market like outcomes”. Individuals will vote with their feet and locate in the community that offers the bundle of public services and taxes they like best. In equilibrium, people distribute themselves across communities on the basis of their demands for such public goods and services. Each individual receives his/her desired level of public services and cannot be made better off by moving. Hence, the equilibrium is Pareto efficient.

2.1.2. Musgrave's Framework

Richard Musgrave's framework for analyzing roles or functions is widely accepted (Musgrave, 1959, 1989). Following the standard Musgrave model of public sector responsibility for stabilization, distribution and allocation (Musgrave, 1959), the decentralization theory provides direction for sharing these functions among different levels of government. The stabilization function involves the role of tax and spending policies and monetary policy in managing the overall level of economic activity. It is widely agreed that this macroeconomic function should be assigned to the national government. The distribution function involves the role of government in changing the distribution of income, wealth or other indicators of economic well being to make them more equitable than would otherwise be the case. The case for assigning this function to the national government rests on two assumptions: (i) that the national government's broad taxing powers can more easily redistribute income; and (ii) that the ability of taxpayers to move from one jurisdiction to another to take advantage of more attractive spending and taxation policies weakens Local government's ability to “soak the rich and redistribute to the poor.” The case for regional and local redistributive policies rests on the fact that sub-national levels of government provide the services most used by low income families. The allocation function is government's role in deciding the mix of public and private goods that are provided by the economy or by government.

2.1.3 The Oates Framework

This framework, which Oates (1972) has formalized into the “Decentralization Theorem” constitutes the basic foundation for what may be referred to as the first generation theory of fiscal

decentralization (Oates, 2006). The theory focuses on situations where different levels of government provide efficient levels of outputs of public goods “for those goods whose special patterns of benefits are encompassed by the geographical scope of jurisdictions” (Oates, 2006). Such state of affairs of providing efficient output came to be known as “perfect mapping” or “fiscal equivalence” (Ma, 1995).

2.2 Empirical Literature Review

Leonid et al. (2018) examined the role and impact of fiscal decentralization on the macroeconomic stability of Ukraine. Their study analyzes and systematizes approaches to the definition of ‘macroeconomic stability’ concept and identifies fiscal decentralization as one of the factors affecting macroeconomic stability. On the other hand, Antonio (2018) analyzed the impact of fiscal decentralization on accountability, economic freedom, political and civil liberties in the Americas. The findings indicate that decentralization initially hampers but eventually enhances accountability and political and civil liberties, in line with the hypothesized positive correlation between greater fiscal autonomy and a more inclusive, participatory government.

Also, Ali & Batool (2017) investigated the impact of fiscal decentralization on macroeconomic stability by using the misery index at country level for Pakistan. This study used Ordinary least square technique to estimate the impact of fiscal decentralization on macroeconomic stability. This study revealed that there is a significant and positive impact of fiscal decentralization on macroeconomic stability. Neyapti (2010) investigated the macroeconomic effects of fiscal decentralization for a panel of 16 countries over 1980-1998. The empirical result indicated that expenditure and revenue decentralization reduce budget deficit which lead to stable environment. The study was of the view that, the effectiveness of fiscal decentralization in reducing deficit is enhanced by greater population. In addition, Iqbal and Nawaz (2010) investigated the effect of fiscal decentralization on macroeconomic stability by using Misery Index at country level for Pakistan. The evidence that has been presented reveals a significant positive impact of fiscal decentralization on macroeconomic stability of Pakistan, although the results are much weaker for expenditure decentralization.

From the existing literature, one can deduce that there are mixed results on the empirical relationship between fiscal decentralization and macroeconomic stability. Hence, it becomes pertinent to empirically investigate whether or not fiscal decentralization fosters economic growth through macroeconomic stability in Nigeria. The question that arises is: – Is Nigeria reaping the benefits of fiscal decentralization or is the country operating the concept of fiscal decentralization on the theoretical concept but neglecting the masses? This study profiles answer to this question empirically with the use of Vector Error correction model and more specifically with a country case study.

3. Methodology

This study uses Musgrave’s theoretical framework as well as the neoclassical production function as the theoretical foundation. The Vector Autoregressive (VAR) model pioneered by Christopher Sims (1980a, 1980b and 1986) is used along with Johanson’s Vector Error Correction Model (VECM) for the empirics. The model used the neoclassical production function in order to establish the relationship between fiscal decentralization and economic growth through macroeconomic stability. This study adopted the work of Iqbal and Nawaz (2010), who accounted

for macroeconomic stability combining inflation rate and unemployment rate in their study. This is to help test the hypothesis that there is a systematic relationship between macroeconomic stability and economic growth. Equation 1.1 below specifies an equation relating MI (the Misery Index), see Iqbal and Nawaz (2010), to economic growth and the two measures of fiscal decentralization. MI here is the sum of the rate of inflation and unemployment rate in the economy, used to measure macroeconomic instability.

Therefore, we hypothesize that :

$$MI = f(GDP, RSEXP, RSREV) \dots \dots \dots (1.1)$$

Where

MI = Sum of Inflation and Unemployment rate

GDP = Growth Rate of real Gross Domestic Product

$RSEXP$ = Ratio of State Government Expenditure to Total Expenditure

$RSREV$ = Ratio of State Government Revenue to Total Revenue

Equation 1.1 expresses the misery index as a function of economic growth which is measured by growth rate of Gross domestic product and fiscal decentralization which is proxy by both the ratio of State government expenditure to total expenditure as well the ratio of State government revenue to total revenue. Thus, from equation (1.1), we can obtain the indirect effect of fiscal decentralization on economic growth.

Specification of the Model

The model takes the form:

$$X_t = \alpha + \sum_{j=1}^p X_{t-j} \Phi_j + U_t, \quad U_t \approx IID(0, \Sigma) \dots \dots \dots (1.2)$$

Where

X_t = the vector of endogenous variables in the system at time t ;

α = vector of constant terms;

X_{t-j} = the lags of the endogenous variables,

Φ_j = the matrix of coefficients of the variables in the system; and

U_t = the vector of random disturbance error terms which are assumed to follow a white noise process, thus they have zero mean and constant variance;

Equation 1.2 is further re-specified in equations 1.3 to 1.6 below hence, the four equation VAR is represented symbolically below:

$$MI_t = b_{10} + \sum \beta_{11} RSEXP_{t-i} + \sum \phi_{12} RSREV_{t-i} + \sum \alpha_{13} GDP_{t-i} + \sum \delta_{14} MI_{t-i} + U_{1t} \dots \dots \dots (1.3)$$

$$RSEXP_t = b_{20} + \sum \beta_{21} RSEXP_{t-i} + \sum \phi_{22} RSREV_{t-i} + \sum \alpha_{23} GDP_{t-i} + \sum \delta_{24} MI_{t-i} + U_{2t} \dots \dots \dots (1.4)$$

$$RSREV_t = b_{30} + \sum \phi_{31} RSREV_{t-i} + \sum \beta_{32} RSEXP_{t-i} + \sum \alpha_{33} GDP_{t-i} + \sum \delta_{34} MI_{t-i} + U_{3t} \dots \dots \dots (1.5)$$

$$GDP_t = b_{40} + \sum \alpha_{41} GDP_{t-i} + \sum \beta_{42} RSEXP_{t-i} + \sum \phi_{43} RSREV_{t-i} + \sum \delta_{44} MI_{t-i} + U_{4t} \dots \dots \dots (1.6)$$

In order to check for robustness of the VAR estimation and also as a result of the existence of a long run relationship in the model, a Vector Error Correction Model is specified and estimated as well. The general framework for the VECM specification is given below:

$$\Delta X_t = \alpha + \sum_{j=i}^p \psi_j \Delta X_{t-j} + ECM_{t-i} + U_t \dots \dots \dots (1.7)$$

Where: ECM_{t-i} is the error correction term.

4. Results and Discussion

The analysis of the results begins with investigating the time series properties of the variables. Before conducting the Augmented Dickey-Fuller test in any time series analysis, it is important to investigate first whether or not the series exhibits a trend.

Table 1: Unit Root Tests of variables

AT LEVELS					First DIFFERENCE				
VARIABLES	ADF	DF-GLS	PP	REMARKS	VARIABLES	ADF	DF-GLS	PP	REMARKS
MI	2.96	1.95	2.95	N.S	MI	2.96	1.95	2.95	DS
RSEXP	2.94	1.95	2.94	N.S	D(RSEXP)	2.95	1.95	2.95	DS
RSREV	2.94	1.95	2.94	N.S	D(RSREV)	1.95	2.64	2.95	DS
GDP	2.94	1.95	2.94	N.S	D(GDP)	2.96	1.95	2.95	DS

Note: The test was carried out at 5% level of significance

N.S =non stationary D.S = difference stationary D = the first difference of the variable

The results of the unit root test using Augmented Dickey-Fuller (ADF), Dickey-fuller GLS (DF-GLS) and Philip Perron (PP) tests, are reported in Table1 and show that all the variables are non-stationary in their levels. Hence, this permits the study to carry out the co-integration test, to identify whether long run equilibrium exists among the variables.

Co-integration Tests

Having established the time series properties of the data, the study proceeds to conduct the Johansen multivariable co-integration test by first determining the number of co-integrating relations in the model.

Table 2. Unrestricted Co-integration Rank Test) (Maximum Eigenvalue)

Hypothesizes No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None*	0.572609	28.05188	27.58434	0.0436
At most 1*	0.516065	23.95156	21.13162	0.0195
At most 2	0.350361	14.23418	14.26460	0.0505

At most 3*	0.273791	10.557265	3.841466	0.0012
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Max-eigenvalue test indicates 2 cointegrating eqn (s) at the 0.05 level

*Denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The result of co-integration test for the four variables VAR suggests that based on Maximum Eigenvalue there is co-integration between the four variables in the model. The test indicates that the variables are co-integrated at the 5% level. This suggested the tendency of a long run relationship among the variables under consideration.

Lag Length Selection Criteria

To determine the optimum lag length, the study tested for statistics which include Sequential Modified Likelihood Ratio (LR) test, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) and Hannan Quin Information Criterion (HQ). The LR, FPE, AIC, HQ and SC indicate lag length of one. The result is shown in the table 3 below:

Table 3: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-846.6711	NA	2.89e+17	51.55583	51.73722	51.61686
1	-841.9126	8.075127*	5.76e+17*	52.23713*	53.14410*	52.54230*
2	-837.1573	6.916750	1.19e+18	52.91863	54.55118	53.46793

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic
(each test at 5% level),

FPE: Final prediction error

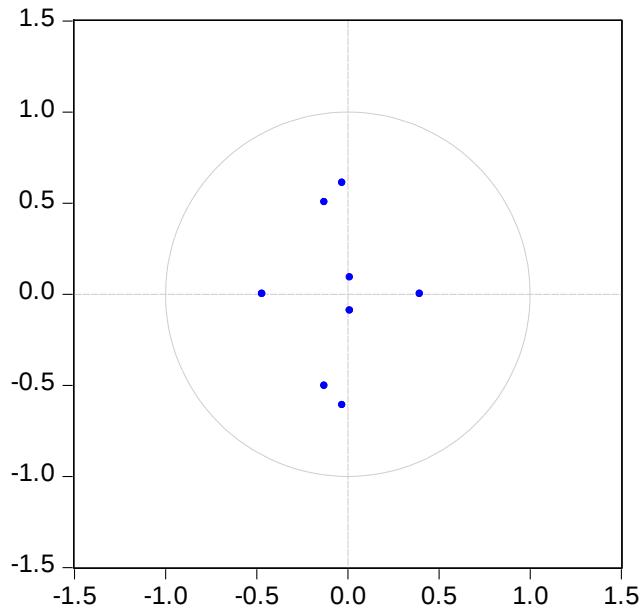
AIC: Akaike information criterion,

SC: Schwarz information criterion

VAR Stability Test

The estimated VAR is stable if all roots have modulus less than one and lie inside the unit circle. The result of AR root stability test satisfies the stability condition of the model.

Inverse Roots of AR Characteristic Polynomial



No root lies outside the unit circle.
VAR satisfies the stability condition.

Presentation of Estimated Empirical Results

This section presents the estimated results for the indirect influence of fiscal decentralization on economic growth through its impact on macroeconomic stability using the Vector autoregressive model (VAR).

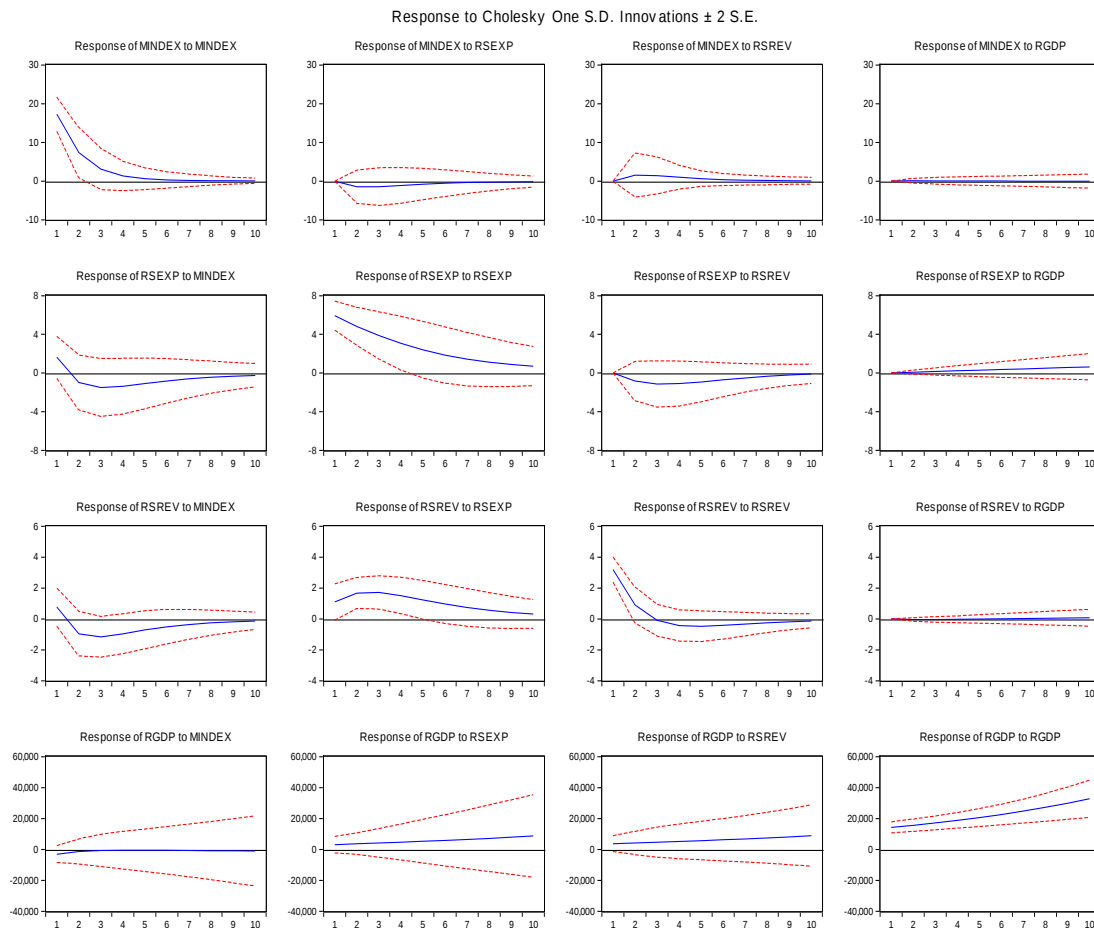
Table 4: Vector Autoregressive Result of the Model

Variables	DMI	DRSEXP	DRSREV	DRGDP
DMI (-1)	-0.059266	-0.060819	-0.069346	-92.75669
	(0.19963)	(0.06030)	(0.04113)	(15168.7)
	[-0.29688]	[-1.00866]	[-1.68606]	[-0.00611]
DRSEXP (-1)	0.339552	0.004536	0.129103	20566.50
	(0.62305)	(0.18819)	(0.12837)	(47342.2)
	[0.54498]	[0.02410]	[1.00575]	[0.43442]
DRSREV (-1)	0.701584	-0.144203	-0.258946	-30195.43
	(0.90167)	(0.27234)	(0.18577)	(68512.9)
	[0.77810]	[-0.52949]	[-1.39392]	[-0.44073]
dRGDP (-1)	-1.18E-07	1.22E-07	7.19E-08	0.091271
	(2.4E-06)	(7.4E-07)	(5.0E-07)	(0.18530)
	[-0.04843]	[0.16623]	[0.14301]	[0.49257]
C	0.449363	-0.027838	-0.002447	257764.5
	(3.38454)	(1.02228)	(0.69731)	(257173.)
	[0.13277]	[-0.02723]	[-0.00351]	[1.00230]
R ²	0.026348	0.061262	0.159620	0.016456
ADJ. R ²	-0.107949	-0.068219	0.043705	-0.119205
AIC	8.891404	6.497044	5.731907	31.36798

SCHWARZ SC	9.115868	6.721508	5.956372	31.59244
Notes: () represent standard error, [] represent t-statistics; */**/**= significant at 10 percent, 5 percent and 1 percent with critical value of 1.282, 1.645 and 2.326 respectively.				

Source: Author's computation, 2020

The one lagged period of MI is not a driver of economic growth as its coefficients for the dependent variables exhibit negatives values and not statistically significant. This implies that MI Measuring instability was inimical to economic growth during this period under observation. This is consistent with literature as high rate of inflation accompanied by high rate of unemployment tend to worsen the economic condition of any nation. The coefficients of RSEXP on MI and other dependent variables though positive are not statistically significant. This implies that fiscal decentralization in terms of sub-national expenditure assignment does not influence the level of macroeconomic stability in Nigeria. Similarly, RSREV did not perform very well as its coefficient is positive and statistically not significant too. This indicates a low impact of this measure of fiscal decentralization in promoting macroeconomic stability in the country. This implies that fiscal decentralization does not have positive impact on Macroeconomic stability that will enhance economic growth. Hence from the estimated result, one can deduce that fiscal decentralization escalate macroeconomic instability as such retard economic growth.



From the impulse function graph above, the shocks tends to be following a pattern that tends to fade off with time. However, some of the variables also experience negative patterns within some of the years but in the long run are restored back to their equilibrium points in the. Thus, the effects being temporal rather than being permanent on the variables involved. The Variable of interest in this segment is that of the MI used as a measure of macroeconomic instability, a look at the figure above shows that there is deviation from the line of origin (i.e. the convergence point) between GDP and MI. This is very worrisome as the shock from these variables will tend to converge slowly towards equilibrium in the very long run. The implication of the drift from these variables shows that the possibility of attaining growth through fiscal decentralization via macroeconomic stability in Nigeria is far from being realistic. From the graph, this finding is also buttressed by the shock of the fiscal decentralization variables as the drift away from MI is quite large. But it is interesting to note from the graph, there is a greater possibility of these variables to converge in the very long run thereby gaining the potential of fiscal decentralization. This gains as proposed by the traditional proponent of fiscal decentralization will not fall from the sky except with an appropriate regulatory economic environment where the rule of law up hold its value. Furthermore, economic stability that will enhance growth can also be achieved through fiscal decentralization when the sub-national government has autonomous devolution of power in terms of revenue and expenditure assignment.

Table 4: Results and Analysis of the Vector Error Correction Estimation (VECM).

SYSTEM EQUATIONS				
VARIABLES	D(MI)	D(GDP)	D(RSEXP)	D(RSREV)
ECT	-0.151271	-0.303907	-0.078598	0.105839
	(0.12188)	(0.06020)	(0.28138)	(0.26251)
	[-1.24119]	[-5.04829]	[-0.27933]	[0.40319]
D(MI(-1))	-0.368459	-0.92646	-0.066671	-0.024204
	(0.19896)	(13775.5)	(0.03511)	(0.05530)
	[-1.85195]	[-0.02898]	[-1.89874]	[-0.43765]
D(GDP(-1))	0.34906	0.059446	0.136653	0.042599
	(0.023490)	(0.13727)	(0.64161)	(0.59858)
	[0.830298]	[0.43306]	[0.21298]	[0.07117]
D(RSEXP(-1))	-0.20416	-0.018708	-0.249823	0.026021
	(0.340612)	(0.04473)	(0.20907)	(0.19505)
	[-0.17308]	[-0.41825]	[-1.19494]	[0.13341]
D(RSREV(-1))	-0.709364	-0.133631	-0.133467	-0.276190
	(1.28793)	(0.04850)	(0.22667)	(0.21147)
	[-0.55078]	[-2.75552]	[-0.58881]	[-1.30605]
CONSTANT	0.142466	0.038028	-0.006445	0.000113
	(0.71034)	(0.01046)	(0.04890)	(0.04562)
	[0.20056]	[3.63513]	[-0.13182]	[0.00248]
LONG RUN EFFECTS				
RSEXP(-1)		-0.332589	(0.16284)	[-2.04247]

RSREV(-1)	-0.280262	(0.23373)	[-1.19909]
R-squared	0.569529	0.105810	0.094776
Adj. R-squared	0.500653	-0.037261	-0.050060
Akaike AIC	-2.998202	0.085845	-0.052994
Schwarz SC	-2.764669	0.319378	0.180539
Notes: () represents standard error, [] represents t-statistics; */**/**= significant at 10 percent, 5 percent and 1 percent.			

The Error Correction Term, which is the speed of adjustment if negative and significant, indicates the error in the model is corrected with time. As regards the results, it is clear from row one that the error correction term for macroeconomic stability, gross domestic product and ratio of state government expenditure to total expenditure is negative and less than one as theory expects, but has very low speed of adjustment for these variables. This suggests that 30% of the previous year's distortions will be corrected for in the economy when the mean values are used. GDP at 1 percent significant level and 15% for macroeconomic stability at 10% significant level. Thus, any time there is deviation in GDP, due to deviation from the explanatory variables, the equilibrium error is corrected with time, with 30 and 15 percent being covered each period.

5. Summary and Conclusion

This paper has examined the relationship between fiscal decentralization and economic growth through macroeconomic stability in Nigeria using time series data from 1980 to 2018 and made an attempt to answer the question as to whether fiscal decentralization can enhance macroeconomic stability thereby resulting to economic growth. Based on the empirical evidence analyzed the result reveals that:

- (i) There is no significant impact of fiscal decentralization on macroeconomic stability of Nigeria.
- (ii) The obtained result in terms of revenue decentralization shows that the sub-national regions depend heavily on the federal government for a large percentage of their revenues.
- (iii) Furthermore, the study found no systematic relationship between fiscal decentralization and macroeconomic stability.
- (iv) In sum, this study shows that the economic benefits of fiscal decentralization in terms of economic growth are minuscule. The claim that, fiscal decentralization will also bring about some sort of economic dividend can be considered as questionable.

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