Determinants of Taxation in Nigeria, 1980 - 2014

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Abstract

Taxation as an indispensable fiscal policy tool in macroeconomic engineering is a major source of revenues for governments all over the globe. Tax policies vary from one economy to another and so does efficiency in tax policy and tax collection varies from one economy to another. However, tax collection efficiency is largely dependent on the determinants of taxation in an economy. Hence the main thrust of this study is to investigate the determinants of taxation in Nigeria for the periods 1980 to 2014. The study adopted the ordinary least squared (OLS) analytical technique in analyzing the data of the study. The findings of the study revealed that income, money supply, interest rate and inflation are significant determinants of taxation in Nigeria. The study hence recommended among others that government should strengthen the tax collection process, review the tax policies periodically to sustain tax income in Nigeria.

Key words: Taxation; Income; Tax reform; and Broad money supply.

Background of the Study

The dependence on oil revenue by the government and the need to diversify revenue sources has overtime given impetus to the reforms in the Nigerian tax laws. According to Alli (2009), the major objective of tax reforms in Nigeria was to bridge the gap between national development needs and the funding of these needs. There were also the desires to make taxation as a fiscal policy instrument as efficient as possible so as to achieve improved service delivery to the public. The urgent need to improve upon the level of revenues derivable from tax was part of reasons for the various tax reforms in Nigeria, and there is also the need to ensure efficiency in tax collection. It therefore became imperative to empirically study the major drivers of taxation in Nigeria for the purpose of efficient tax policies and tax collection optimization in Nigeria as expected tax revenues are dependent on these key drivers which will either broaden or contrast the overall tax base in the economy.

Ogbonna and Ebimobowei (2012) stated that, the Nigerian tax system has experienced series of reforms since 1904 to date. These reforms include:

- Introduction of income tax in Nigeria between 1904 and 1926;
- Grant of autonomy to the Nigerian Inland Revenue (NIR) in 1945;
- The Raisman Fiscal Commission (RFC) of 1957;
- Formation of the Inland Revenue Board (IRB) in 1958;
- The promulgation of the Petroleum Profits Tax Ordinance (PPTO) No 15 of 1959;

- The promulgation of Income Tax Management Act (ITMA) 1961;
- Establishment of the Lagos State Inland revenue Department;
- The promulgation of the Companies Income Tax Act (CITA) 1979;
- Establishment of the Federal Inland Revenue Services (FIRS) between 1991 and 1992 and
- The tax policy and administration reforms amendment 2001 and 2004.

According to Ogbonna and Ebimonowei (2012), as a result of the 2004 tax reform, nine bills on tax were approved and subsequently became law in Nigeria for the enforcement and administration of tax. They include Federal Inland Revenue Service Act, 2004, Companies Income Tax Act, 2004, Petroleum Profits Tax Act, 2004; Personal Income Tax Act, 2004, Value Added tax Act, 2004; Education Tax Act, 2004, Customs, Excise Tariffs etc (consolidation) Act 2004, and National Automotive Council Act, 2004. The Chartered Institute of Taxation of Nigeria (CITN) was then established to regulate tax practice and administration in the Nigeria and to this extent, a major stakeholder in the Nigerian tax system.

Before independence, the colonial rulers treated Nigeria as an extension of British territory and therefore applied the British tax legislation in Nigeria. It was Lord Lugard, the Governor-General who first introduced income tax in 1904 in Northern Nigeria when community tax became operative there through the revenue Ordinances of 1904(Soyode and Kajola 2006).

The Native Revenue Ordinance (NRO) of 1917 reflects changes to 1904 Ordinance. In 1918, provisions of 1917 Ordinance was amended and then extended to Southern Nigeria first to Abeokuta in the then Western Nigeria and to Benin City in Mid-Western Nigeria and then to Eastern Nigeria in 1928. The provisions of Native revenue Ordinances of 1917, 1918 and 1928 were later incorporated into the Direct Taxation Ordinance (DTO) No. 4 of 1940 cap. 54. The original Inland Revenue Departments (IRD) or those who determined the taxable income were; the resident officer appointed by the Governor General to be in charge of administration of the particular province in question together with any other administrative officer authorized by the resident officer to perform any duties imposed upon the resident under the ordinance, Chiefs, elders and other persons of influence in each district. Native authority appointed by native law and customs were recognized as the tax collection authority. So also were native authority appointed by the Governor to be a tax collection authority. Village council, head men or other suitable persons or group of persons appointed by the Governor were also empowered to collect taxes.

The history or development of personal income tax in Nigeria is incomplete without due considerations to the roles played by local government or native administrations as they were then called. Personal Income Tax was first administered and collected by the native administrations in the name of Direct Taxation (DT) under the Direct Taxation Ordinance (DTO) 1940. The assessment and collection of tax was the primary responsibility of native administrations throughout the country and the tax collected was the major source of revenue. The Direct taxation Ordinance (DTO) was a poll tax which taxed the profits of all native residents in the protectorate and elsewhere other than the township of Lagos (Soyode and Kajola, 2006).

Government at every point in time strives to mobilize adequate resources or generate revenue adequate enough to fund its budget in order to enhance productive capacity. One

of the regular and assured means of generating the much needed revenue is through the imposition of taxes at all levels of economic activity within the economy. Thus, taxation is an important source of revenue to the government. This underscores the eagerness on the part of governments to be more aggressive and innovative in the mode of collecting or mobilizing revenue from existing sources (Dennis and Emmanuel, 2014).

Economic theories have shown that, taxation plays a crucial role in determining economic growth (Gbura and Hadji-Michael 1996; Gbura 1997; Beddlies 1999). This has influenced the extensive studies on the effects of taxation on economic growth in Nigeria some of these studies include:Tosun and Abizadoh 2005, Olusanya et al 2012, Adereti et al 2011, Nwakanma and Nnamdi 2013, Ihenyen and Mieseigha 2014, Izedonmi and Okunbor 2014, Anoremi and Ajala, 2013.However, the major objective of this study is to empirically determine the determinants of taxation in Nigeria. A good tax system not only tries to mobilize the existing economic surplus but also seek to raise it with a view to mopping up relatively greater amount of increase in national income.

Conceptual Issues

Taxation

Tax is a compulsory levy by the government on individuals, companies, goods and services to raise revenue for operations and promote social equity through the redistribution of income effect of taxation Anyanwu et al (1997). According to Bhatia (2008), it is a compulsory levy upon an economic unit by the government without any corresponding entitlement to obtain a direct or definite service. That is to say that, the essence of taxation is not for a direct reward to the payer as if the entity paying is receiving a specific reward for such payment. Bhatia (2003) describes the obligation as a *quid pro quo* (not taken as equivalent or priced for a service rendered or item for exchange). To align with the understanding of Alasan (2003), taxation is compulsory and government can therefore; apply all means available to demand payment of tax.

The other observation worthy of note is that the authority to levy tax lies only with the appropriate authority of government and can enforce the payment through constitutional means.

According to Olorunleka (1985), taxation is defined as a process by which group of people contribute part of their income for the purpose of the administration and development of the society. Taxation therefore, establishes a social contract between the government and the governed. Since taxation must be made to cover these common functions of government, it must ensure efficiency in administration to be able to garner the desired volume of revenues.

Nightingale (1997), described tax as a compulsory contribution imposed by the government and he concluded that even though tax payers may receive nothing identifiable in return for their contribution, they nevertheless have the benefit of living in a relatively educated, healthy and safe society. Black (2003), stated that tax is a payment compulsorily collected from the individuals or firms by the central, state or local governments. It may be noted that, public receipts containing elements of compulsion does not automatically become a tax. In order to be a tax, there must not be a quid pro quo. Tax incentives received by tax payers from the government are not related to or based upon their being tax payers. According to Cambridge International Dictionary of English, tax is "an amount of money paid to the government, usually a percentage (%) of

personal income or compulsory profits" etc. A tax is a compulsory exaction of money by a public authority for public purposes, or is a system of raising money for the purposes of government by means of contribution from individuals, persons or corporate body (Soyede and Kajola, 2006).

Bhatia (2008), stated that there was a time when under the influence of Laissez faire philosophy, it was advocated that the state should have a neutral tax policy. In other words, the state, in order to perform its functions needed certain amount of revenue and that should be raised with no or minimum modifications in the economic parameters generated by the market forces. Such reasoning may be presented by using the concept of "general fiscal rationality". It implies that the fiscal action of the government should not interfere with the smooth operation of other economic agents within the economy.This view implicitly assumes that in a free market mechanism, the pattern of resource allocation and production conforms to the social marginal rates of substitution between different goods and services. Obviously, this reasoning is based upon the fundamental assumption that the economic parameters created by the free market are optimum, and the state can raise tax revenue without undue interference in the working of the economy.Another fact that is clear from the above is that levying of tax is within the purview of government. The government whether at the local, state or federal level has the responsibilities to meet the yearning of the citizens. The need to meet the expectations of good governance in a modern society is the rationale for levying taxes (Bhatia, 2008).

Tax Policy

According to Abramovitz (op.cit), it is a familiar maxim in capitalist countries that taxes should be light in order to provide as large a surplus for individual saving as possible. He further asserts that between indirect taxes and direct especially progressive taxes are better for saving since they protect the large income surplus of the rich and do not shrink the rewards of accumulation. While in central planned economies, taxes must be heavy to provide for the needed government funding of collective consumption and provision of the general welfare of the state.

Moshood, et al. (2000), opined that tax structure varies around the world with the motive of attaining maximum revenue with minimum distortion. They further argued that different countries have different philosophies about taxation and different methods for collection. There is no doubt that the revenue arising from this taxation can also be deplored differently for country wide preferences. These preferences of revenue allocation and application affect growth differently too. Accordingly, it can rightly be observed that different uses of government expenditure affect economic growth differently.

The Impact of Taxation on Economic Growth in Nigeria.

Taxation should serve as an instrument of economic growth in developing economies like Nigeria. It mobilizes resources for governments to fund their budgets, thereby financing public goods. A good tax system for developing country will be such as will enable the government to mobilize adequate resources for capital formation and economic growth. Ebiringa and Emeh (2012), indicates that company income tax and VAT shows positive effect in the Gross Domestic Product of Nigeria however implying that if company tax

and VAT are increased, the country will witness appreciable impact in the Gross Domestic Product and this no doubt will positively affect the welfare of the citizens.

Atkinson (1995), was of the view that different applications of total government expenditure most of which are generated from taxation, affect growth differently. Due (1964), supports that countries which are based on indirect taxation have growth more rapidly than those based on direct taxation. Indirect taxation according to Abramontz (op.cit), are more preferred in capitalist countries not because of its benefit tendency to growth, but protects the sources and reward private savings, reward for work, skill and responsibility. Beyond this, indirect tax is easy to collectand less resistance to pay by the tax payers. As a result of these inherent benefits in the structure, the indirect tax system portends acceleration of economic growth.

Holzman (ibid), in support of taxation as accelerator for economic growth opined that chief source of savings is taxation. He emphasized that the level of saving depends in part on government policy and on the efficiency of tax administration. This indicates that taxation has a linkage with economic growth. He therefore conclude that, since taxation must be extremely heavy in order to cover both the more common functions of government and to provide for investment, the problem of choosing forms of taxation least destructive to production incentives and to the functioning of price mechanism and allocation of resources is important. This mobilization can be done either through Mobilization of economic surplus and or Increase in incremental savings ratio.

Structure of Taxation in Nigeria

Anyanwu, et al. (1997) noted that, in Nigeria, the major fiscal policy instruments include changes in taxation rates (on personal income, company income, petroleum profits, capital gains, import duties, export duties and excise duties, as well as mining rents, royalties and NNPC earnings), and government expenditure (recurrent and capital). These taxes along with interests, repayments, licenses and fees constitute government revenue. Such taxes are imposed not only to generate revenue but also to provide incentives and disincentives in certain specific socio-economic activities. Tariff rates are also varied not only to regulate the external sector of the economy but also to encourage domestic production as well as to protect domestic particularly infant industries.

Ndekwu (1991), explained that within the structure of the federal tax, total indirect taxes declined in importance from71.9 percent in 1970 to a mere 14.1 percent in 1991. This was largely explained by the fall in import duties which declined from 41.8 percent in 1970 to 7.04 percent in 1989. However, the relative and cyclical decline in importance of import duties and hence indirect taxes was compensated by the rising importance of Petroleum Profits Tax (PPT) which emerged in the 1970s as the dominating tax source.

According to Anyanwu, et al. (1997), its relative contribution to the revenue increased steadily from 18.9 percent in 1970 to 78 percent in 1980 but to 48.9 percent in 1991. The sharp fall in the importance of the PPT occurred in 1985 when the PPT law was amended to "net in" the earnings of the Nigerian National Petroleum Corporation (NNPC) rent and royalties. The impact of that amendment was the rise in the relative share of oil revenue sources which hitherto was experiencing a declining trend. Consequently, oil revenue sources increased in relative importance to78.1 percent in 1991. This structural shift and the resultant dominance of oil sources had made the Nigerian tax system to be highly unstable, dependent as it is largely on oil revenue.

Theoretical Literature Review

Theory of Tax Level Determinants:
Predicated on the theory of tax determinants, Hinrichs (1965) in hus study "Determinants of Government Revenue Share among Less Developed Countries," demonstrated that in less developed countries, tax level differences are correlated to the "degree of openness" measured by imports as a percentage of gross national product. Suggesting few possible reasons for his finding, he did not offer much empirical support for his reasoning.
Lotz and Morss (1970) in their "A Theory of Tax Level Determinants for Developing Countries" had given detailed consideration to some of the factors likely to influence tax levels in developing countries, suggesting that availability of taxable bases is a crucial determinant to tax levels in in less developed countries than the variations in the demand for Government expenditures. This conclusion was based on the finding on factors measuring tax administrative capacity, while not very meaningful as indicators of demand for public service, are highly significant in explaining the tax ratios in developing countries.
Redian (1980) reviewing theories of tax level determinants in developing countries, attempted to identify determinants of Government revenue through statistical analysis of aggregate economic variables but this yielded few definite results. Economic factors such as national income, and the internal structure of the economy, was found to set the broad limits and opportunities for resource mobilization, though there are substantial variations that are unexplainable within the framework of economic theories.

Review of Empirical Literature
Tosun and Abizadeh (2005), study tax charges in OECD countries and economic growth from 1980 to 1999. The study reveals that economic growth which was proxied by GDP has significant relationship with tax charges especially, from personal and property taxes.
Olusanya et al (2012), carried investigation on taxation as a fiscal policy instrument for income redistribution in Lagos state. Spearman's rank correlation was used to analyze the date which finding indicates a positive relationship between taxation as a fiscal policy instrument for economic development.
The exploratory study of Adereti etal (2011), on the effect of Value Added Tax (VAT) and economic growth provided positive co-relationship. Three stages least square estimation technique was adopted in the study carried out by Worlu and Emeka (2012), on tax revenue and economic development in Nigeria. The study reveal that tax revenue stimulate economic growth through infrastructural development.
Nwakanma and Nnamdi (2013), carried out a study which examined taxation and National development. The least square method was adopted in the study which finding indicate that Petroleum Profit Tax, Company Income Tax and Excise tax have positive relationship with the level of national development.
Ihenyen and Mieseigha (2014), studied taxation as an instrument of economic growth; the Nigerian Prospective using time series data from 1980 to 2013 in a linear model, the result indicate that taxation is an instrument of economic growth in Nigeria.
Izedonmi and Okunbor (2014), examined the contribution of the Value Added Tax on the economic growth of Nigeria. The study adopted time series data from 1994 to 2010.

Multiple regressions were used in the model which study show a significant relationship between the variables and economic growth.

The study carried out by Anoremi and Ajala (2013), explored the VAT and revenue generation using the stepwise regression analysis in the study. Their findings indicate statistically, a significant relationship between taxation and economic growth.

Bakare (2013), investigated the Value Added Tax and the growth rate in Nigeria. The Ordinary Least Square technique adopted in the study reveal a positive relationship between the tax system and the output growth in Nigeria. Positive economic growth rate was established between Value Added Tax and economic growth in the study carried out by Olatunji (2009). The study adopted the simple percentage and chi-square.

Similarly, Ayuba (2014), investigated the impact of non-oil tax revenue on the economic growth of Nigeria. The study adopted the time series approach and spanned for the period of 1993 to 2012. The analysis of statistical data obtained using the OLS show a positive relationship of the impact of non-oil taxes on the economic growth.

The study of Salami etal (2015), investigated the impact of taxation on the growth of Nigerian economy from 1976 to 2006. OLS was adopted as the technique to analyze the result which shows a significant impact of taxation on the economy.

Soyode and Kajola (2006), posited that tax evasion and its sister tax avoidance are one of the fundamental problems of tax administration in a developing country like Nigeria. All forms of taxes in Nigeria are to some extent avoided or evaded largely because the administrative machinery to ensure effectiveness is weak. Because of diversity and complexity in human nature, no tax law can capture everything. Loopholes will exist and can only be reduced but not completely eliminated. Tax evasion and uncontrolled tax avoidance must be viewed seriously. It leads to loss of revenue for the government even honest tax payers lose faith in tax system and are tempted to join the league of tax evaders if it becomes widespread and unchecked.

Shuaib, Ekeria and Ogedengbe (2015), studied the impact of fiscal policy on the growth of the Nigerian economy. Time series data between 1960 -2012 was used in the investigation which finding established a strong relationship between capital formation and economic growth.

Zhang (2001), study on, direct foreign investment reveal a positive growth impact which is similar to domestic investment. His study employed Ordinary Least Square (OLS) technique to analyze the result of the regression. He therefore, opined that, through technology transfer and Spillover efficiency, the inflow of direct foreign investment might be able to stimulate the country's economic performance.

Ogbonna and Appah (2012), studied the effects of Petroleum Income tax between 2000 to 2009. The Gross Domestic Product (GDP), was proxied for the economy. The simple regression technique was adopted in the study which show the revenue arising from the taxation of Petroleum products positively affect the economic growth of the country.

Panel data study of Ferede and Dahlby (2012), tested the impact of the provincial governments tax rates on economic growth in Canada. The study covered the period 1977 to 2006. The finding indicates that sales tax boosts provincial investment and growth.

Methodology

Model Specification
The study employed the ordinary least squared (OLS) analytical technique in analyzing the data of this study where the model was estimated in the context of Error Correction Mechanism (ECM). The model of this study was specified to include; taxation, income (RGDP), broad money supply (MS_2), interest rate (INT), and inflation (INF). Where incomeis proxied by Real-GDP (RGDP), and taxation is expressed as a function of income, broad money supply, interest rate, and inflation rate. This relationship is empirically expressed follows;

$$TAX = f(RGDP, MS_2, INT, INT)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

Equation (1) is expressed in the explicit lol-log specification as:

$$LogTAX = \alpha_0 + \alpha_1 RGDP + a_2 logMS_2 + \alpha_3 INT + a_4 logINF + \mu \dots\dots\dots\dots\dots\dots..(2)$$

Apriori theoretical expectation

$\alpha_1 > 0; \alpha_2 > 0; \alpha_3 > 0; \alpha_4 > 0$

Where:

LogTAX	=	logged taxation
logMS$_2$	=	logged money supply
LogINF	=	logged inflation rate
RGDP	=	Real GDP
INT	=	interest rate
μ	=	stochastic term

Nature and Sources of Data
This study employed secondary data sourced from statistical bulletins (various issues) of the Central Bank of Nigeria (CBN) and also from the National Bureau of Statistics (NBS) publications (various editions). The data series sourced therefrom and used in this study include; taxation (TAX), income (RGDP), broad money supply (MS_2), interest rate (INT), and inflation rate (INF) for periods 1980 to 2014.

Data Analysis
Stationarity Tests
In order to test the time series properties of the data set with the aim of determining the order of integration, the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) test statistics was employed. The unit root tests results shown in table1 below revealed that the variables are stationary only after the differencing, in other words the variables are I(1) stationary. See table below.

Table 1: Stationarity Test

Unit Root Tests				Unit Root Tests			
Date: 10/01/17 Time: 13:10				Date: 10/01/17 Time: 13:10			
Sample: 1980 2014				Sample: 1980 2014			
Test Type: ADF				Test Type: PP			
	Level	First	Order of		Level	First	Order of Int.

			Int.				
INF	-2.86192	-5.55319	I(1)	INFR	-2.86125	-10.0842	I(1)
INT	-2.40151	-7.13721	I(1)	INTR	-2.30988	-7.338	I(1)
$LOGMS_2$	-1.46539	-3.5625	I(1)	LOGMSP	-1.16775	-3.62331	I(1)
LOGRGDP	-2.76411	-4.50879	I(1)	LOGRGDP	-2.71796	-6.39848	I(1)
LOGTAX	-1.65144	-5.10213	I(1)	LOGTXTN	-1.64811	-5.16519	I(1)
5% level	-2.95113	-2.95402		5% level	-2.95113	-2.95402	
10% level	-2.6143	-2.61582		10% level	-2.6143	-2.61582	

 Source: Author's own computation

The result from the stationarity tests above calls for further test for long run relationship. Hence, the Johansen cointegration test was employed as shown below;

Co-integration Test
We now turn to determine the existence of long run equilibrium relationship between among the variables. The co-integration tests are based on the Johansen and Juselius (1989) test. Johansen's tests were carried out to check, if the variables are co-integrated.

Table 2: Trace and Maximum Eigen Statistics

Date: 10/01/17   Time: 15:48
Sample (adjusted): 1982 2014
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: LOGTAX LOGRGDP $LOGMS_2$ INF INT
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.749032	118.3636	69.81889	0.0000
At most 1 *	0.621295	72.74346	47.85613	0.0001
At most 2 *	0.537786	40.70051	29.79707	0.0019
At most 3	0.295270	15.23351	15.49471	0.0547
At most 4	0.105671	3.685490	3.841466	0.0549

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

 Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.749032	45.62012	33.87687	0.0013
At most 1 *	0.621295	32.04295	27.58434	0.0125
At most 2 *	0.537786	25.46700	21.13162	0.0115
At most 3	0.295270	11.54802	14.26460	0.1288
At most 4	0.105671	3.685490	3.841466	0.0549

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

From the result above, the trace statistics and the Maximum Eigenvalue statistics collaborated themselves as they both indicated three cointegrating equations at 5 percent level of significance.

Error Correction model
The confirmation of the existence of co-integrating equations provides the impetus for carrying out short-run dynamic adjustment model estimation, the error correction mechanism (ECM) as shown below:

Table 3: Dynamic Error Correction Model on Taxation

Dependent Variable: D(LOGTAX)
Method: Least Squares
Date: 10/01/17   Time: 16:43
Sample (adjusted): 1984 2014
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.538768	0.418035	3.680958	0.8031
D(LOGRGDP)	0.960314	0.217408	4.417109	0.0008
D(LOGRGDP(-1))	0.182749	0.218022	0.838212	0.0183
D(LOGRGDP(-2))	0.389790	0.221157	1.762503	0.1034
D(LOGMS$_2$)	1.407930	0.323119	4.357316	0.0009
D(LOGMS$_2$(-2))	0.722402	0.248569	2.906242	0.0132
D(LOGMS$_2$(-3))	0.649379	0.325205	1.996827	0.0690
D(INT)	-1.367036	0.497840	-2.745937	0.0177
D(INF(-1))	-1.108419	0.369563	-2.999272	0.0111
D(INF(-2))	0.920878	0.266664	3.453322	0.0048
D(INF(-3))	-0.388791	0.094587	-4.110386	0.0014
ECM (-1)	-0.500999	0.162900	-3.075510	0.0065
R-squared	0.873559	Mean dependent var		0.053927

Adjusted R-squared	0.704971	S.D. dependent var	0.200930
S.E. of regression	0.109138	Akaike info criterion	-1.302376
Sum squared resid	0.142934	Schwarz criterion	-0.500858
Log likelihood	35.88446	Hannan-Quinn criter.	-1.051351
F-statistic	5.181618	Durbin-Watson stat	1.836987
Prob(F-statistic)	0.003162		

Author's computation (2015)

The parsimonious error correction model above shows that, the error correction term is well specified and it is significant at 5 percent level of significance. This supports our earlier conclusion that taxation and its regressors are indeed co-integrated. The speed of adjustment is the coefficient of the error correction term (ECM). It also indicates how the movement of the long-run equilibrium is corrected in the short-run. The explanatory variables included in the model explained 87 percent of the variability in taxation.

The co-efficient of the ECM term is -0.50. The negative sign is an indication of the existence of a long-run equilibrium relationship between taxation and the variables that influence its short run movement which were used in the model. In fact, there is a fairly high speed of adjustment of 50 percent between the short run and long run equilibrium behaviour of taxation (TAX) and its determinants. Hence, it is of a good fit. The F-statistics measuring the joint significance of all the regressors in the model is statistically significant at 1 percent level. Also, the Durbin-Watson statistic of 1.84 is an indication of the absence of autocorrelation in the model.

From the result obtained above in table 3, there is significant relationship between taxation and income in Nigeria. The effect on taxation (TAX) is positive and significant at 1 percent level of significance. This implies that as income increases, TAX increases. This agrees with our theoretical expectation of the model. The above estimation also revealed that money supply (MS_2) is positive and significant at 1 percent level of significance. This implies that, as money supply (MS_2) increases, taxation also rises.

The coefficient of interest rate is negative but significant at 5 percent level of significance. While inflation rate is significant at 5 percent level of significance and positive at lag 2. Thus income as proxied by real gross domestic product (RGDP), broad money supply (MS_2), interest rate (INTR), and inflation rate are major determinants of taxation in Nigeria.

Stability test

The stability of the parameters in the short run taxation model is examined, using the plots of the cumulative sum of recursive residual (Cusum). Cusum test is particularly useful for detecting the systematic changes in the regression coefficient. If either of the straight lines in the graphs is crossed, the null hypotheses that the regression equation is correctly specified are rejected at 5 percent level of significance. From the graphs presented, Cusum graph stayed within the 5 percent critical line, indicating parameter constancy throughout the sample period in the study, hence the model is dynamically stable. This is shown below.

Figure1: Stability test for Taxation Equation
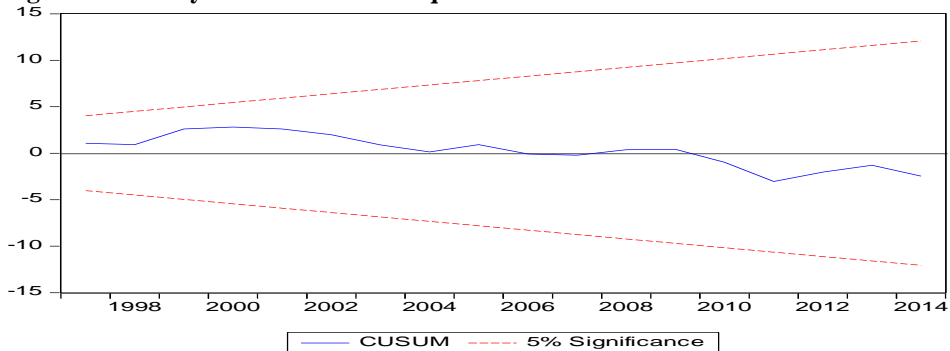
Author's computation (2017)

Findings/Conclusion

The study findings revealed that income (RGDP), money supply (MS_2), interest rate (INT), and inflation rate (INF) are major determinants of Taxation in Nigeria. It was also established that taxation has a link with capital formation which is necessary but not sufficient condition for robust and sustainable economic growth in Nigeria.

Recommendations

The following recommendations are necessary in view of the findings of the work;
1.   Government should strengthen the tax collection process so as to generate the much needed revenue to shore up the capital infrastructure needed for sustained economic growth.
2.   Government should set their priorities right and deploy substantial part of the nation's budget on capital expenditure.

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APPENDIX A

Table : Data Presentation

YEAR	TAX	RGDP	MS$_2$	INT	INF
1980	15234.0	4.20	15100.0	8.43	9.9
1981	12180.2	20.84	16161.7	8.39	20.9
1982	11764.4	-1.05	18093.6	9.54	7.7
1983	10508.7	-5.05	20879.1	9.54	23.2
1984	11191.2	-2.02	23370.0	10.24	39.6
1985	14606.1	8.32	26277.6	9.43	5.5
1986	12302.0	-8.75	27389.8	10.50	5.4
1987	25099.8	-10.75	33667.4	13.96	10.2
1988	27310.8	7.54	45446.9	16.30	38.3
1989	50200.0	6.47	47055.0	20.44	40.9
1990	68570.5	12.77	68662.5	25.30	7.5
1991	88158.7	-0.62	87499.8	20.04	13.0
1992	78364.6	0.43	129085.5	24.76	44.5
1993	83261.7	2.09	198479.2	31.65	57.2
1994	80813.2	0.91	266944.9	20.48	57.0
1995	82037.5	-0.31	318763.5	20.24	72.8
1996	81425.4	4.99	370333.5	19.70	29.3
1997	81731.5	2.80	429731.3	18.40	8.5
1998	81578.5	2.72	525637.8	18.30	10.0
1999	81655.	0.47	699733.7	20.53	6.6
2000	81616.8	5.32	1036079.5	21.32	6.9
2001	81635.9	8.16	1315869.1	21.34	18.9
2002	81626.4	21.18	1599494.6	29.70	12.9
2003	81631.2	10.34	1985191.8	22.47	14.0
2004	81628.8	10.59	2263587.9	20.62	15.0
2005	81630	5.39	2814846.1	19.47	17.9
2006	81629.4	6.21	4027901.7	21.03	15.0
2007	81629.7	6.97	5314952.25	20.37	17.9
2008	81629.6	5.98	4052666.7	20.29	12.8
2009	81629.7	6.96	4465140.2	20.56	6.1
2010	81629.7	7.80	4610886.3	20.41	9.5
2011	61629.3	4.90	4379530.9	20.43	10.8
2012	74962.9	4.30	4485385.5	20.47	8.8
2013	72740.6	5.40	4491934.0	20.43	9.7
2014	69777.5	6.31	4452283.2	20.44	9.8

Source: CBN, Statistical Bulletin (various issues)
NBS, Publication (various issues)
Author's computation, 2015