Impact of shadow/underground economy on economic growth: evidence from the Nigerian economy

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ABSTRACT

The shadow/underground economy involves criminal activities and some other activities that pose a threat to lives and properties in an economy. Underground economic activities distort the quality of macroeconomic aggregates (like unemployment, official labour force, income and consumption) that policy makers rely on to inform their macroeconomic policies. The consequence is the sub-optimal performance of policy recommendations because they are based on inaccurate information about the actual size of the economy. Moreover, growth of the underground economy can set off a vicious cycle: as transactions in the underground economy escape taxation, tax revenue is reduced and the tax base eroded. The broad objective of the study is to examine the impact of shadow/underground economy on economic growth in Nigeria from 1980 to 2017. The specific objectives are to: investigate the extent to which unreported income of underground economy affect economic growth in Nigeria and also to ascertain the extent to which tax evasion of the underground economy affect economic growth in Nigeria. This study adopted ex post-facto research design. The method data analysis were Augmented Dickey-Fuller Unit Root test statistic, error-correction mechanism (ECM) and Durbin-watson test. The following variables were used in the study, Real GDP as the dependent variable, while tax revenue, electricity consumption, money supply, report of human trafficking and smuggling of migrants (Dummy variable) and report of prostitution (Dummy variable). The method of data analysis was the error-correction mechanism. The study concluded that there is a significant positive impact of the underground economy on economic growth in Nigeria because most of the variables under study were statistically significant. The study reveals that tax burden (TAXBUR) results to 0.56 (56%) of tax evasion and avoidance; hence it also impacts on the economy. The study also reveals that the underground economy using currency demand as an instrument of measurement results to 0.60 (60%) impact on the Nigeria economy. The human trafficking, smuggle migrant and prostitution form the large size of the underground economy in Nigeria. The underground economy using electricity (ELECT) as an instrument of measurement has an insignificant effect on the real gross domestic product (RGDP) because most of the underground economic activities in Nigeria do not make use of electricity. This study recommends among others that government should relax some business regulations that prompt private businesses to go into hiding by the mere mentioning of government and create a friendly business environment by legalizing some activities hitherto regarded as underground economic activities - like patent medicine stores to prevent tax revenue losses. This study also recommends that the government should come up with stringent measures to enforce the rule of law as it affects human trafficking, smuggles migrants and prostitution which form the larger size of the underground economy in Nigeria.
1.0. Introduction

Underground or shadow economic activity is all over the world and studies abound to prove that it is on the increase. Some countries try to reduce underground economy through education or stiff sanctions instead of reforms in both the tax and social security system, which could improve the dynamics of the official economy.

The underground economy is part of any economy where transactions occur illegally that is away from official eyes (Omodero, 2019). It is called shadow economy, black economy, or informal sector. Gathering information about shadow economic activity is difficult because people who work in the underground economy do not want to be identified; hence their incomes are not declared. In other words, the tax authorities have no official records of their activities or transactions. The activities and transactions that occur in the underground economy are illegal for two main reasons: a transaction that would otherwise be licit does not adhere to government reporting requirements, and the product or service is illegal. Narcotic drugs (illegal or illicit drugs), and prostitution in most jurisdictions, are examples of illegal goods and services. Informal labour and contraband, for example, are licit transactions that have not complied with official regulations. The smugglers do not pay import duties on imported products.

According estimates by the International Monetary Fund (IMF, 2018), the American underground economy reached $1 trillion, representing approximately 8% of the gross domestic product (GDP). However, by 2013, mainly due to long-term effects of the 2008 financial crisis and the resulting contraction of the formal economy, underground economic expenditures reached an estimated $2 trillion. Compared to most other nations, America's underground economy is relatively flat, according to findings published by a 2018 International Monetary Fund study in progress, which explored the shadow economic activity of 158 countries, between 1991 to 2015. Some of the main points in the report are as follows: the mean value of the size of the shadow economy across all nations was 31.9%. The nations with the three largest shadow economies were Zimbabwe (60.6%), Bolivia (62.3%), and Georgia (64.9%). The three smallest shadow economies were Austria (8.9%), the United States (8.3%), and Switzerland (7.2%) (International Monetary Fund, 2017).

Although income earned in the underground economy is quickly spent in the formal economy and can stimulate economic growth and tax revenues (if indirect taxes are used), a thriving underground economy impacts negatively on the government’s ability to provide goods and services, increases unfair competition by forcing legitimate businesses out of the market also, and also provide a haven for criminal activities including tax evasion.

Underground economic activities distort the quality of macroeconomic aggregates (like unemployment, official labour force, income and consumption) that policy makers rely on to inform their macroeconomic policies. The consequence is the sub-optimal performance of policy recommendations because they are based on inaccurate information about the actual size of the economy. Moreover, growth of the underground economy can set off a vicious cycle: as transactions in the underground economy escape taxation, tax revenue is reduced and the tax base eroded. Governments may then respond by raising taxes, thus encouraging further flight into the underground economy leading to additional fiscal imbalances (Ariyo and Bekoe, 2012).

In all economies of the world, particularly in developing and transition economies, a good number of economic activities are carried on outside the formal economy. The Nigerian tax system is faced with serious challenges of assessing and taxing unreported economic activities which escape the dragnet of the tax authorities and eventually lead to loss of tax revenue (Ihendinihu, 2013). For instance, there are many unregistered businesses of different sizes and types whose income are not levied. There are also people who pay no tax at all on their earnings, while some other people pay tax on some earnings and do not declare other additional sources of income. The unrealized tax revenue resulting from these and similar activities has therefore become a major and apparently growing problem in Nigeria. These have the effect of eroding the tax base with negative consequences on the capacity of government to finance its numerous projects and programmes, as well as in funding other costs of governance. No doubt, the emerging situation could breed inefficiency and increase public discontent over quality of government services. The development could further induce further flight of economic activities into the underground economy. This major objective of the study is to examine the impact of underground economy on economic growth. The specific objectives are to investigate the impact of unreported income of underground economy on Economic Growth in Nigeria; and ascertain the impact of tax evasion of underground economy on Economic Growth in Nigeria.

2.0. Literature Review

2.1. Concept of Underground Economy

The underground economy refers to economic transactions that are deemed illegal, either because the goods or services traded are unlawful in nature, or because transactions fail to comply with governmental reporting requirements. Alternatively referred to as the shadow economy, the black market, or the informal economy, the underground economy in the United States mainly comprises the sale of street drugs and illegal prostitution. Other primary examples of underground economic activity include untaxed labor, the untaxed sale of physical goods, and the smuggling of goods into a country to avoid paying duties at the border. Human trafficking operations also comprise the underground economy, as do the markets for copyrighted materials, endangered animal species, antiques, and illegally-harvested human organs (Andrew, 2019).

Greenidge (2009) defines the underground economy as any economic activity that does not appear in the statistics of the National Income and Gross Domestic Product (GDP). This definition presumes that, while illegal activity lies within the hidden economy, there are many legal ones that may fall within the economy. Thus, one who gets extra income working in his spare time but does not report this income is said to participate in underground economy.

In defining underground economy, the ethical judgment of different societies and governments are brought to bear. For instance, while in countries such as Netherlands, Nevada and Italy, prostitution is legal, official and taxable activities, in other countries such as Nigeria it is not. Similarly, while some countries approve sale of alcohol as legal activities, other countries such as Islamic countries do not. The lack of consensus in formulating a precise definition
of components that comprise underground economy suggests that important questions remained unanswered (Fleming et al., 2000). While agreeing to the definitions given above, this study adopts the definition of shadow economy as one that includes all unreported incomes from production of legal goods and services, either from monetary or barter transactions—and so includes all economic activities that would generally be taxable were they reported to the state (tax) authorities. Within the meaning conveyed in this definition, Ihendinhu (2013) concludes that both legal and illegal activities can exist underground noting that it is the unregulated and unreported nature of a transaction that puts it outside the dragnet of government agencies and this is essential in classifying an activity/transaction as underground and not its legality.

2.2. Theoretical approaches to underground economy

In measuring underground economy, there are direct and indirect approaches.

2.2.1. Direct Approach: The direct approach involves the use of surveys and samples which are based on the way the questionnaires are formulated and the willingness of the respondents to cooperate and provide truthful answers. Thus, it is obvious that the direct approach which has to do with the use of surveys, samples and even tax auditing may not be able to capture all informal activities (Omodero, 2019). Survey-based technique is jeopardized with undervaluation of the over-all size of the underground economy due to non-response and truthful response given the complex nature of the subject matter (Putnins & Sauka, 2015). The tax audit reveals the level of tax evasions and undeclared taxable income which could also be used to estimate the size of the underground economy.

2.2.2. Indirect Approaches

These are macroeconomic approaches that try to use an indicator of the informal economy as a proxy for its size or growth.

Discrepancy between the National Expenditure and Income Statistics Approach

In theory, the income measure of GDP and the expenditure measure should be equal to each other. However, informal activities can show up in the expenditure measurement but not in the income measurement. This is because the income side is measured through the value added of registered firms (the formal economy), while on the expenditure side there is some self-reporting. Thus, the difference between these two measures is an indicator of the size of the informal economy. The problem with this estimate is that statisticians would like to make the difference between the two as small as possible; so, using the initial measure rather than the published measure would be ideal. Moreover, there are differences due to sampling and statistical errors, which cannot be disentangled from the amount that can be explained by the informal economy (Restrepo-Echavarria, 2015).

Discrepancy between Official and Actual Labor Force Statistics Approach: Assuming that the total labor force participation is constant, all else being the same, then any decrease in the labor force participation in the official economy can be seen as an indicator of an increase in the activity in the informal economy. That is, if the total labor force participation is assumed to be constant, the decline in the official labor force participation is considered as growth in the informal economy (Schneider & Enste, 2000; Medina et al., 2017). The problem with this method is that changes in labor force participation can be due to other causes. For example, following the recent recession, many people have exited the labor force. It could also be the case that people work in both the informal and formal economy; so, this is not a very good estimator.

The Transactions Approach

In 1979, economist Edgar Feige developed this approach based on the quantitative theory of money \( MV = PT \), where \( M \) is money, \( V \) is velocity, \( P \) is prices and \( T \) is total transactions.

The main assumption is that the relationship of the volume of transactions and official gross national product (GNP) is constant over time. Using the value of total transactions \( (pT) \) as an estimate of nominal GNP, he calculated the informal economy as the difference between nominal GNP and the official GNP. Several issues arise with this approach. He had to assume there is a base year when there was no informal economy. Then, the assumption that the ratio of transactions to official GNP is constant over time was quite strong. Additionally, obtaining accurate estimates of the total number of transactions was difficult.

The Currency Demand Approach

This approach uses the correlation between currency demand and tax pressure, assuming that informal activities operate with cash. Thus, if the tax burden increases and so does the demand for money, then that increase in the demand for money reflects an increase in the informal economy. In order to calculate the excess in money demand, the economists behind this approach estimated an equation for money demand using econometric methods. They controlled for development of income, payment habits, interest rates and other related variables. In the equation, they also included government regulation, direct and indirect tax burden, and the complexity of the tax system. Under this assumption, an increase in the size of the shadow economy increases the demand for cash. Mughal and Schneider (2018) successfully applied the currency demand approach and it helped to establish that shadow economy in Pakistan had a long term positive effect on economic growth while on a short term, it negatively affected growth.

The Physical Input (Electricity Consumption) Method

This method assumes that electricity consumption is the best physical indicator of both formal and informal economic activity. It has been observed that the electricity/GDP elasticity is usually close to 1.8. So, by using electricity as a proxy for the overall economic activity and then subtracting from it the official estimates of GDP, we get an indicator of informal economic activity. The difference between the growth of electricity consumption and official GDP is then attributed to the growth of the informal economy (Restrepo-Echavarria, 2015; Omodero, 2019). The critiques to this approach rely on the fact that not all informal activities require a considerable amount of electricity, or, if they do, other energy sources such as gas, oil and coal could be used. Also, the use of electricity has become more and more efficient in both types of economies. Finally, there may be differences in the elasticity of electricity/GDP across countries or changes over time. Ultimately, the approach used to measure the informal economy.
Impact of shadow/underground economy on economic growth: evidence from the Nigerian economy

The size of the underground economy and its impact on economic growth have been the subject of extensive research. The underground economy, characterized by activities not reported to tax authorities or other regulatory agencies, has been found to affect economic growth both positively and negatively. The high rate of tax evasion in Nigeria is a significant concern, as it impacts the government's ability to generate revenue and provide public services.

2.3 Empirical Review

The link between underground economy and economic growth has attracted the attention of the researchers and scholars. The issue under review is a vital subject that should be subjected to painstaking empirical review in order to keep abreast with the positions of the concerned researchers and scholars on this subject and to determine the gap inherent in the earlier related studies.

Ihendinihu, Uzoma and Ochonma, (2010) conduct a study with the objective of estimating the size of shadow activities in Nigeria, and investigating the existence or otherwise of any causal links between tax and non-tax factors and growth in the size of underground economy in Nigeria. A blend of descriptive survey and causal comparative research designs were adopted. Annual data on basic Money Supply components, Gross Domestic Product (GDP), and total Federally Collected Tax Revenue (TAXREV) were collected for the period 1992 to 2006. The estimation model was derived following the Gutmann's Currency Demand Approach. The Ordinary Least Square Technique was used in analyzing the data. The work estimates the size of underground economy in Nigeria at 62.8% of GDP, identifying a weak positive relationship between tax burden and the size of shadow economy. It however implicates high poverty level, illiteracy, unemployment, corruption and low net wage in the official economy as significant factors that drive entrepreneurs into the unofficial economy.

Omodero, (2019) evaluates the impact of shadow economy using the transaction approach and the MIMIC approach which helped to determine the size of the shadow economy as a percentage of GDP and the tax revenue losses suffered by the government for a period spanning from 1991 to 2018. Ordinary least squares method is used to examine the impact of tax revenue earned and lost on Nigeria's GDP. The regression results indicate that tax revenue earned has a significant positive impact on economic growth in Nigeria from 1970 to 2010. The study found evidence that the driving forces of underground economy activities do more harm to the government than good and is also detrimental to Nigeria's economic progress.

Hanousek and Palda (2007), in their study on Displacement Deadweight Loss from Tax Evasion, found that in the presence of the underground economy taxes give rise to a deadweight loss from displacement of efficient producers by inefficient producers. They considered an economy in which a producer faces two types of costs: the cost of production and taxes. If the ability to evade taxes is inversely proportional to the ability to keep production costs low, high tax rates may cause inefficient producers to crowd out efficient producers. They estimated this deadweight loss from surveys of 426 Czech firms taken in 2004 and 2005. They further found that the deadweight loss due to this crowding out could be several times as large as the deadweight losses from discouraged consumption.

Ariyo and Bekoe (2012) seek to identify the determinants of the underground economy and to characterize the trend and estimate both the size of the underground economy and the magnitude of tax evasion in Nigeria during of 1975 to 2010. The study employed the currency demand approach to derive estimates for the size of the underground economy and magnitude of tax evasion. The Error Correction Model was also used to capture the speed of adjustment to long-run equilibrium. The results from the analysis indicated that the size of underground economy and magnitude of tax evasion for the study period ranged between 42.5% – 79.32% and 2.09% – 6.75% of GDP respectively. The results also established a positive relationship between tax rate, size of underground economy and magnitude of tax evasion. Tax rate, inflation, interest rate, high income inequalities, and the generally low productivity of the Nigerian tax system due principally to deficiencies in tax administration and collection systems and complex legislation were the driving forces behind the growth in the underground economy and tax evasion.

Nmesirionye, and Ihendinihu, (2016) examine effect of the value of unrealized tax revenue resulting from underground economic activities on economic growth in Nigeria. Macro-economic (time series) data for the period 1980-2013. The formulated hypotheses were tested using correlation and simple regression techniques. The results show that Nigeria lost a total of N38,357.3 billion in tax revenue over the period with an average of aboutN1,128.2 billion per annum as a result of underground activities in the country. The resulting trend indicates a steady growth from 1980 with N8.2 billion to an all height peak of N5.048 billion in 2005, and dropping to about N2,095 billion in 2013. The results also affirm that significant causal link exists between the size of underground economy and total unrealized tax revenue, with about 85.7% of the changes in annual tax revenue losses attributable to variations in size of underground economic activities.

Schneider (2011) considered the development, unreported activities and size of the shadow economy in Organization for Economic Cooperation and Development (OECD), developing and transition countries. The study also measured the size of the informal employment in the rural and non-rural sectors; the findings showed that the most influential factors on the shadow economy and informal employment were tax policies and state regulations.

Schneider and Buehn (2013) investigated the determinants of underground economy in 39 highly developed OECD countries. The study found evidence that the driving forces of the underground economy in these countries included: tax policies, government regulations, and unemployment, self-employment and heavy tax burdens. Further findings revealed that from 1999 to 2010, indirect taxes were estimated to be 29.4%, unemployment was 16.9%, personal income tax was 13.1% and tax morale was 9.5%.

Ogbuabor and Malaolu (2013) employed error correction multiple indicators multiple causes (EMIMIC) model to evaluate the size and causes of the informal economy in Nigeria from 1970 to 2010. The study found evidence that from 1970 to 2010, the size of the informal economy had been within the average of 64.6% of GDP. Further findings revealed that the major drivers of informal economy in Nigeria include tax burden, government regulations, unemployment and rate of inflation.
Manole (2014) examined the impact of underground economy on Romanian economy using a linear regression model. The study covered a period from 1999 to 2012 and discovered that underground economy had a significant negative impact on Romanian GDP. The study also found that in Romania, the underground economy share in the GDP is about 30% which is a cause for concern. The study suggested an effective policy step to make underground economy less attractive.

Schneider et al. (2015) examined the size of the shadow economy in 28 European Union (EU) countries from 2003 to 2014 using percentage of official GDP. The study disclosed that the average size of the shadow economy in the 28 European Union (EU) countries was 22.6% in 2003 but decreased to 18% in 2014. The unemployment and self-employment was 14.6% and tax morale was 14.5% while the GDP growth was 14.3%. Tax evasion was 4.2% in Poland, Czech Republic was 2.9% while in Germany it was 1.9%.

Zaman and Goschin (2015) used synthetic index data of shadow economy in Romania from 1999 to 2012. In order to assess the impact of shadow economy on Romania's economic growth, the synthetic index was transformed into an econometric model and the statistical results showed a co-integration relationship which implied that shadow economy have a long term consistent relationship with the formal economy.

Putnins and Sauka (2015) made use of survey approach whereby information were obtained from company managers regarding the size of a shadow economy. According to the authors, these company managers were in the position to know the size of unreported business income, unregistered employees and the unreported wages. The data gathered were used to estimate the size of a shadow economy as a percentage of GDP in three new EU member countries which included: Estonia, Latvia and Lithuania for a period covering 2009 to 2012. The findings revealed that the size of the shadow economy in Latvia, Estonia and Lithuania were 30.2%, 18.9% and 17.1% respectively.

Nehor, Adamec and Kolman (2016) compared the size of shadow economies existing in Ghana, Nigeria and UK using the MIMIC model and data set from 1983 to 2011. The results showed that the sizes of shadow economy in Ghana, Nigeria and UK were 36.73%, 47.75% and 15.05% respectively. The study further revealed that unemployment was a common causal factor for shadow economy in all the countries, while tax burden was observed in Ghana and Nigeria, but UK had the highest level of self-employment while Nigeria had the highest level of business regulation. The high level of business regulation in Nigeria is the reason for the establishment of numerous unregistered private enterprises which are promoting tax evasions because some of the informal activities are not actually illegitimate in nature.

In line with the idea to prevent tax evasions, Yelwa and Adam (2017) studied the impact of informal sector activities on economic growth in Nigeria using data set from 1980 to 2014. The study found that the informal sector impacted on economic growth positively and recommend that the sector should be formalized and taxed accordingly in order to improve tax revenue in the country.

Anwar, Akbar, Akbar and Azhar (2017) measured the underground economy in Pakistan using the expenditure based method of Pissarides and Weber as well as data set covering a period from 2011 to 2012. The study assumed that self-employment might lead to understatement of income while employees’ income (salaries and wages) could be taxed directly. The result showed that the understated self-employed income was about 13.1% which was 1.08 times of the disclosed income. The study established that the underground economy was about 14.148% of GDP in 2012 in Pakistan.

Medina, Jonelis and Mehmet (2017) applied the light intensity approach and the Predictive Mean Matching (PMM) method to estimate the size of the informal economy in Sub-Saharan Africa. The study found evidence that the informal economy ranged as low as 20% to 25% in Mauritius, South Africa and Namibia while in Benin, Tanzania and Nigeria the range was as high as 50% to 65%. This study confirms the claim of IMF (2017) that the shadow economy is contributing up to 65% of Nigeria’s nominal GDP.

Medina and Schneider (2018) extended the study on shadow economy using 158 countries across the world randomly and covering a period from 1991 to 2015. The methods used in the study were Currency Demand Approach (CDA) and Multiple Indicators Multiple Causes (MIMIC) in a structured hybrid-model based estimation procedure. The study focused on determining the average size of the shadow economy of the 158 countries randomly. It was 31.9 per cent for the period. The countries that had the highest percentage of the shadow economy in their GDP were Zimbabwe and Bolivia having 60.6% and 62.3% respectively. The lowest was Austria and Switzerland having 8.9% and 7.2% respectively.

Guillermo and Deyvi (2018) studied the impact of the informal economy on tax revenues and economic growth using a panel data of OECD members and Latin America countries from 1995 to 2016. The study made use of a MIMIC approach and Generalized Moment Method (GMM) in order to establish the impact of the size of the informal economy on economic growth and tax revenue collection. The findings revealed that the estimated average size of the informal economy as a percentage of the GDP for Latin America Countries was 34% while, in the case of the OECD Countries, it was 19.83%. From the results, the country with the largest size of unofficial economy in Latin America was Peru, with a size of 37.4% of the GDP for 2016 while for OECD Countries; Turkey had the highest unofficial economy with a size of 29.75% of the GDP for 2016. The results also indicated that the Latin America country with the smallest size of informal economy was Uruguay with 14.47% while that of OECD was Denmark with 12.84%, both for 2016. However, the study generally found that for both Latin America and OECD countries, the informal economy had a negative impact on the amount of tax revenue collected by the government.

3.0. Methodology and Sources of Data

This study made use of ex post-facto research design which enables us to measure the effect or relationship between dependent variable and explanatory variables using time-series secondary data. To empirically examine the impact of underground economy on the economic growth in Nigeria, the researcher subjected the data collected to Augmented Dickey-Fuller Unit Root test statistic, error-correction mechanism (ECM) and Durbin-watson test.
3.1. Data and Sources

To investigate size of underground economy and its effect on economic growth in Nigeria, a number of variables have been taken into consideration in this study. These variables consist of direct and indirect tax contribution to GDP, electricity generation and consumption (Megawatts per Hour), money supply, dummy variables in respect to human trafficking and smuggling of migrant (unreported income) and prostitution (unreported earnings) and Real Gross Domestic Product (RGDP) for the period of 1980-2017 and are defined in our model specification. All the variables were sourced from Central Bank of Nigeria’s (CBN) statistical bulletin for various years, National Bureau of Statistics (NBS), Nigeria Immigration Service Report (NIS), Paper Report on prostitution and National Agency for the Prohibition of Trafficking in Persons (NAPTIP).

3.2 Model Specification

This study adopted Ihendinhu, Uzoma and Ochonna, (2010) who examine the causal links between tax and non-tax factors and growth in the size of underground economy in Nigeria. Thus, the model is represented in a functional form of the model as shown below:

\[ RGDP = F (TAXBUR, ELECT, CUEDEM, UNREPI, UNREPE) \]

Where,

- \( RGDP = \) Real GDP (Dependent variable)
- \( TAXBUR = \) Tax Burden proxy by tax Revenue (Independent variable)
- \( ELECT = \) Electricity generation and consumption (Independent variable)
- \( CUEDEM = \) Current Demand proxy by Money Supply-measuring size of underground economy using currency demand Approach (Dependent variable)
- \( UNREPI = \) Unreported income (Dummy: report of human trafficking and smuggling of migrants = 1 and non-report of human trafficking and smuggling of migrants = 0, using Survey Approach)
- \( UNR.EPE = \) Unreported Earning (Dummy: report of prostitution = 1 and non-report of prostitution = 0, using Survey Approach)

In a linear function, it is represented as follows:

\[ RGDP = \beta_0 + \beta_1 ELECT + \beta_2 CUEDEM + \beta_3 TAXBUR + \beta_4 UNREPI + \beta_5 UNREPE + Ut \ldots (2) \]

Where: \( \beta_0 = \) Constant term, \( \beta_1 \) to \( \beta_5 = \) Regression coefficient and \( Ut = \) Error Term.

4.0 Results and Discussion

The results of the stationarity (unit root) test indicate that current demand, tax revenue and electricity consumption (Megawatts per Hour) and Real Gross Domestic Product (RGDP) were stationary at first difference. The variables on human trafficking and smuggling of migrants are dummy variables, they do not undergo unit root test. It is now referable to use Error Correction regression Model to estimate the parameters.

Error correction mechanism was carried out to examine parameters estimates. In testing this hypothesis, tax burden (TAXBUR), electricity consumption (ELECT), currency demand (CUEDEM) and dummy variables on human trafficking and prostitution were regressed against Real Gross Domestic Product (RGDP). The empirical result shows that the coefficient of tax burden (TAXBUR) has 0.56 (56%) positive significant effect on Real Gross Domestic Product (RGDP) because observed values of t–statistics (5.068979) was greater than its P-values (0.0003). The currency demands (CUEDEM) has 0.60 (60%) positive significant effect on Real Gross Domestic Product (RGDP) because observed values of t–statistics (7.418409) was greater than its P-values (0.0000). The human trafficking has 0.43 (43%) positive significant effect on Real Gross Domestic Product (RGDP) because observed values of t–statistics (4.355413) was greater than its P-values (0.0005). The prostitution 0.62 (62%) positive significant effect on Real Gross Domestic Product (RGDP) because observed values of t–statistics (3.116900) was greater than its P-values (0.0006). The electricity (ELECT) has 0.67 (67%) positive insignificant effect on Real Gross Domestic Product (RGDP) because observed values of t–statistics (0.168519) was less than its P-values (0.2033). The results of the F – statistical test show that the overall regression of the variables was statistically significant. This is because observed values of the F–statistic (4.232) was greater than its P-value (0.004725). The ECM statistic showed that the model has 48% of the speed of adjusting from short-run to long-run every year. Again, our empirical result shows that the adjusted R-squared (R²) is 0.504269. Explanatory powers of the variables were fair.

The Durbin-watson test was used to identify whether the model suffer from autocorrelation problem. The autocorrelation problem violates ordinary least square (OLS) assumption that says there is no correlation among error terms of different observation. The result of Durbin–Watson test (2.002637) carried out at five percent level of significance shows that the model is free from Autocorrelation problem was greater than upper critical value of Durbin-watson (1.58). This denotes that prediction base of the Ordinary Least Square estimates were efficient and unbiases.

5.0 Conclusion/ Recommendations

The study concludes that there is positive significant impact of underground economy on economic growth in Nigeria. This is despite the fact that underground economic activities are criminal and pose threat to lives and properties. The study finds that tax burden (TAXBUR) was 0.56 of tax evasion and avoidance and 0.60 of the underground economy results from currency demand in Nigeria. This means that the percentage of individual who feel over burdened by the state and who choose the “exit option” rather than the “voice option” are on the increase.
This study therefore recommends that government should act to curb this by reducing tax rates which results in greater compliance. With this in place, government should embark on frequent tax audits and impose heavy penalties to defaulters to reduce tax evasion and avoidance. This study also recommends that government should come up with measures to eliminate human trafficking, smuggle migrants and prostitution which contribute larger percentage to the underground economy in Nigeria.

This study further recommends that government should relax some business regulations that prompt private businesses to go into hiding by mere mentioning of government and create friendly business environment by legalizing some activities heretofore regarded as underground economic activities - like patent medicine stores e.t.c to prevent tax revenue losses.

Furthermore, government should put more emphasis on the rule of law and on the strict enforcement especially as it concerns shadow economic activities. It is to be noted that weak and discretionary administration of the law provides fertile ground for shadow/underground economic activities.

Finally, urgent efforts by the Federal, State and other stakeholders are needed to boost agriculture through grants, credits and guarantees to encourage the youths

### Table 1: Results of Stationarity (unit root) test.

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF- Statistics</th>
<th>Critical Value</th>
<th>Order of integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDP</td>
<td>-6.042212</td>
<td>1% level = -3.66784</td>
<td>Stationary first difference</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5% level = -2.945842</td>
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<tr>
<td></td>
<td></td>
<td>10% level = -2.611531</td>
<td></td>
</tr>
<tr>
<td>ELECT</td>
<td>-5.8984</td>
<td>1% level = -3.66784</td>
<td>Stationary first difference</td>
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<td></td>
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<tr>
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<td></td>
<td>10% level = -2.611531</td>
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<tr>
<td>CUEDEM</td>
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<td>1% level = -3.66784</td>
<td>Stationary first difference</td>
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<tr>
<td></td>
<td></td>
<td>5% level = -2.945842</td>
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<td></td>
<td>10% level = -2.611531</td>
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<tr>
<td>TAXBUR</td>
<td>-6.470994</td>
<td>1% level = -3.66784</td>
<td>Stationary first difference</td>
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<tr>
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<td>5% level = -2.945842</td>
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<td></td>
<td></td>
<td>10% level = -2.611531</td>
<td></td>
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</tbody>
</table>

### 4.1 Data Analysis

**Dependent Variable: D(RGDP,1)**

Method: Least Squares  
Date: 09/18/19  Time: 13:30  
Sample (adjusted): 1981 2017  
Included observations: 36 after adjustments

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
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<tbody>
<tr>
<td>C</td>
<td>91254.57</td>
<td>34807.15</td>
<td>2.621719</td>
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<tr>
<td>D(TAXBUR,1)</td>
<td>0.569733</td>
<td>0.112396</td>
<td>5.068979</td>
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<td>D(ELECT,1)</td>
<td>0.679002</td>
<td>4.029219</td>
<td>0.168519</td>
<td>0.2033</td>
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<tr>
<td>D(CUEDEM,1)</td>
<td>0.609771</td>
<td>0.082197</td>
<td>7.418409</td>
<td>0.0000</td>
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<tr>
<td>TRAFFICKING</td>
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<td>1.007322</td>
<td>4.355413</td>
<td>0.0005</td>
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<tr>
<td>PROSTITUTION</td>
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<td>2.010347</td>
<td>3.116900</td>
<td>0.0006</td>
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<tr>
<td>ECM-1</td>
<td>-0.487735</td>
<td>0.128427</td>
<td>-3.797762</td>
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</table>

R-squared 0.504269  Mean dependent var 977.0092  
Adjusted R-squared 0.441359  S.D. dependent var 90290.51  
S.E. of regression 73276.81  Akaike info criterion 25.41454  
Sum squared resid 1.56E+11  Schwarz criterion 25.72245  
Log likelihood -450.4618  Hannan-Quinn criter. 25.52201  
F-statistic 4.023284  Durbin-Watson stat 2.002637  
Prob(F-statistic) 0.004725

i. This study therefore recommends that government should act to curb this by reducing tax rates which results in greater compliance. With this in place, government should embark on frequent tax audits and impose heavy penalties to defaulters to reduce tax evasion and avoidance. This study also recommends that government should come up with measures to eliminate human trafficking, smuggle migrants and prostitution which contribute larger percentage to the underground economy in Nigeria.

ii. This study further recommends that government should relax some business regulations that prompt private businesses to go into hiding by mere mention-
4.2 Econometric /Second Order Test

<table>
<thead>
<tr>
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<td>Model 1</td>
<td>2.002637</td>
<td>1.58</td>
<td>AA</td>
</tr>
</tbody>
</table>

AA = Autocorrelation Absent

to embrace agriculture thereby diverting their attention away from shadow economic activities

References


