



Research Article

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The Financial and Economic Implications of Underground Economy: The Nigerian Perspective

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Abstract

The economic and financial effect of underground economy in all emerging countries is of tremendous concern. Sometimes due to the inputs of the sector to economic growth of nations, it is usually assumed that the government has nothing to lose, meanwhile it goes beyond the seemingly economic benefits, but provides an avenue whereby the government has to suffer financial losses through unavoidable and inherent tax evasions. This study 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, while the tax revenue loss has a significant negative influence on GDP. The study finds that underground economy activities do more harm to the government than good and is also detrimental to Nigeria's economic progress. Therefore the suggestion among others is that the legal activities among them should be formalized and taxed while the unlawful ones should be exterminated.

Keywords: *Underground economy, tax revenue, financial and economic implication, government*

1. Introduction

Underground economic activities have remained a prevalent universal economic scenario and are even more predominant in the developing countries where they are regarded as the major means of sustenance for the masses. These activities are not officially registered but contribute immensely to the national income (Ogunc & Yilmaz, 2000). Presently, underground economy in Nigeria accounts for about 65 percent of the Nominal GDP with agriculture having almost 92 percent share of the informal sector (International Monetary Fund, 2017). There are so many economic issues that have left emerging economies such as Nigeria at the mercy of the informal economy, among them are high rate of unemployment, too many government regulations, stringent tax policies as well as corruption. The situation is such that self-employment increases everyday as the level of unemployment rises, and so people easily find employment in the informal sector to be able to earn their living. The government's inability to provide official employment has led to the emergence of several unregistered enterprises in the name of entrepreneurship. Welter, Smallbone and Pobol (2015) confirmed that underground economy gives the enablement, freedom and allows active involvement in private enterprise. Several terms have been used to describe underground economy among them are: shadow economy, unofficial economy, informal sector or economy, parallel economy, clandestine economy, hidden or black economy (Mughal & Schneider, 2018).

Underground economy emerges where fiscal and structural policies become too burdensome (Mathias, Lux, Crook, Autry & Zaretzki, 2015) especially policies that increase tax liabilities for firms and individuals. Thus, shadow economy provides firms an opportunity to evade government strict regulations and have access to cheap labour and materials (Goel, Saunoris & Schneider, 2017). According to Zaman and Goschin (2015), underground economy has potential benefits and could be very visible especially where corruption exists in public administration, in addition to dishonest behavior of the policy makers and constant misuse of public funds. Therefore, informal economy involves all productive economic activities that would have been subject to tax and social contributions but are consciously hidden from the tax authorities due to tax burdens (Buehn, Dell'Anno & Schneider, 2012; Schneider & Williams, 2013). However, whichever way the informal sector is being described, the financial implication is that, the activities are hidden and so the incomes are not disclosed for the government to earn the tax revenues accruing from them while on the other hand it is helping the economy to improve through unofficial job creation and input to a country's nominal gross domestic product. The objective of this study is to establish the financial and economic implications of the underground economy on economic growth. This is achieved by determining the amount of tax revenue earned by the government and the tax revenue the government has lost within the period under study. The purpose is to empirically examine the influences of both of them on Nigeria's economic performance.

2. Literature Review

2.1 Definitions of underground economy

The definition and measurement of the underground economy has been so complex due to the fact that the activities are not observable, however many researchers (Buehn, Dell'Anno & Schneider, 2012; Schneider & Williams, 2013; Putniņš & Sauka, 2015; Chen and Schneider, 2018) and organizations have endeavored to provide a rational definition that could appear somehow realistic. Thus, efforts to give a suitable definition of the informal economy resulted to terms such as unofficial economy, underground economy, unregistered economy, informal sector and shadow economy being applied most of the time, unfortunately none of the definitions has been found to be appropriate. In the midst of this confusion, Olga, Yulee and Tatyana (2018) asserted that there is a 'terminological chaos' with the underground economy as a result terms such as illegal, criminal, extralegal, informal and shadow among others are applied interchangeably, just to describe the underground economy. Chen and Schneider (2018) came up with a popular definition in their research which states that the underground economy comprises all unlawful economic activities and income which contribute to the officially observed Gross National Product. Putniņš and Sauka (2015) removed the illegitimacy of the economic activities and income from the definition, and described the underground economy as the production of legitimate goods and services that are hidden from the public authorities. In an effort to highlight the marketability of the underground economy, Smith (1994, p. 18) thus defined it as "market-based production of goods and services, whether legal or illegal that escapes detection in the official estimates of GDP."

Therefore, considering the definitions above, an underground economy can be described as all market-based legal merchandises and services that are intentionally hidden from the government authorities in order to evade or avoid complying with tax obligations, contribution to social security, meeting official labor requirement in form of minimum wage payment, official working hours, safety measures among others. However, the definition of the European Union statistics office (Eurostat, 2005) gives a comprehensive description of what an underground economy really stands for. In this definition the unobservable economy is divided into five segments, which are:

1. Underground production: these are economic undertakings that are legal and productive but are consciously hidden from the public authorities to avoid complying with regulations and to deliberately evade payment of taxes;
2. Informal sector production: it comprises all legal economic activities conducted by individuals, at home or in small enterprises, which are not recorded by the official statistics

- department, even if they are not intended to escape taxation and government restriction.
3. Illegal production: this involves all criminal activities, production of products and services prohibited by statutes or activities that become illegitimate when executed through illegal measures;
 4. Household production for own/final use: these are production of goods or services the households produce and also consume them or depend on them as means of livelihood;
 5. Statistical deficiency: all productive activities that ought to be taken into account in the data gathering platforms but are omitted due to inefficiency in data capturing.

2.2 Theoretical approaches to underground economy

In measuring shadow 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 (Isanchen & Strom, 1985; Witte, 1987; Mogensen, Kvist, Kormendi & Pedersen, 1995). 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 shadow economy (Putnins & Sauka, 2015). Although Putnins & Sauka, 2015 successfully used the direct approach, claiming that managers are in the position to know the level of unreported income of their firms as well as the workers' pay that are not disclosed, Reilly and Krstic (2017) appreciated it and equally applied it in their study. However, the criticism is that the direct approach does not accurately measure the size of shadow economy existing in an economy since the estimation is dependent on the willingness of certain individuals to provide the right answers to the questions and also to grant interviews or not. Schneider, Raczkowski and Mroz (2015) explained that underground economy is a natural element of our economic and social life, so in order to have a better understanding of it, the direct estimation may be misleading and that is why a thorough evaluation of its major causes and effects becomes very necessary (Remeikiene, Gasparaniene, Chadysas & Cepel, 2018).

2.2.2 Indirect approaches

National accounting statistics approach. The size of the underground economy can be determined by finding the difference between the income and expenditure statistics captured in the national accounting or in individual data. This approach assumes that all the components of the expenditure side are measured without error since those working in the informal sector cannot hide their expenditure in the same manner they hide their income to evade tax. Thus the difference between national income and national expenditure estimates could be used to measure the size of the informal economy (Medina, Jonelis & Mehmet, 2017).

Transaction approach. This approach uses data gathered on the overall transactions in the economy which represents both the official and unofficial nominal GDP, thus the estimated size of the shadow economy is subtracted from the total nominal GDP (Schneider & Enste, 2000). Transaction approach is adopted in this present study because it is the method used to determine the size of the shadow economy that is subtracted from the nominal GDP before arriving at the tax revenue losses captured in table 1 below.

Labour force statistics. Supposing the labour force figure is beginning to decline from the usual constant participation rate, then the difference represents the shadow economy. That is, if the total labour force participation is assumed to be constant, the decline in the official labour force participation is considered as growth in the informal economy (Schneider & Enste, 2000; Medina *et*

al., 2017).

Multiple indicator multiple cause (MIMIC) approach. Under the MIMIC approach, the causes of the underground economy are identified depending on the economy under study and then the consequences of the shadow economy are also highlighted. Some of the factors that determine an underground economy are observable while some are not noticeable as well as its effects (Schneider & Enste, 2010; Vuletin, 2009; Abdih & Medina, 2016). For instance, in Nigeria, underground economy is caused by the challenge of strict government regulations, tax burden, corruption, increase in unemployment rate and private enterprises giving opportunity for self-employment. The resultant effects are constant government revenue leakages through tax revenue losses, increase in nominal GDP and so much money withheld by the public. The MIMIC approach was found very useful in measuring the level of the informal sector in the studies of (Nchor, Adamec & Kolman, 2016; Guillermo & Deyvi, 2018; Remeikiene et al. 2018) among others. In this study, MIMIC approach has been found relevant since the shadow economy results in tax revenue losses which is one of the independent variables employed to determine the financial implication of the underground economy in Nigeria.

Currency demand approach. The currency demand approach is based on the assumption that shadow transactions are undertaken with cash in order to avoid leaving evidence that authorities could trace (Tanzi, 1980; 1983; 1999; Feige & Urban, 2008). 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.

Electricity consumption approach. This approach uses aggregate electricity consumption to arrive at total GDP which is made up of both official and unofficial GDP. Based on this background, when the official GDP is subtracted from the estimated total GDP, the balance is the size of the shadow economy (Kaufmann & Kaliberda, 1996; Feige & Urban, 2008). The challenges with this approach is that most informal activities do not require electricity while GDP based on electricity consumption might have significant variation across countries (Del Boza & Forte, 1982; Portes, 1996; Johnson, Kaufmann & Shleifer, 1997). This approach has been used in Medina, Jonelis and Mehmet (2017) to estimate the size of the underground economy in selected Sub-Saharan African Countries.

2.3 Empirical review

Schneider (2011) considered the development, unreported activities and size of the shadow economy in OECD, developing and transition countries. The study also measured the size of the informal employment in the rural and non-rural sector, the findings showed that the most influential factors on the shadow economy and informal employment were tax policies and state regulations. The study further revealed that an increase in the two major factors caused a tremendous rise in both shadow economy and shadow labor force. 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 political steps to make underground economy less attractive. Schneider (2014) discussed other findings on shadow economy in an essay form where he stated that the most influential factors of shadow economy were tax policies and state regulations. The study investigated about 25 highly developed OECD countries, 116 developing countries and 25 transition countries from 1999 to 2007. The study found decrease in the shadow economy for 162 countries globally. Official GDP was 34% in 1999 but decreased to 31.2% in 2007, the decrease was mostly noticed in the unemployment rate.

Elgin and Birinci (2015) analyzed the impact of the informal economies on economic growth of 161 countries from 1950-2010. The findings indicated that both small and large sizes of shadow economy had relationship with little growth in GDP per capita while the medium sizes of informal economy could be associated with higher levels of growth in GDP per capita. Kireenko and Nevzorova (2015) examined the impact of shadow economy on the level and quality of life using samples from 150 countries and for a period from 1999-2007. In order to achieve the objective of the study, the population growth rate, unemployment rate and life expectancy at birth and out of school rate for children were the indicators used. Thus, the study provided an evidence that the level of life increased in the same proportion with the shadow economy's growth, while the quality of life represented by education, long and healthy life reduced as shadow economy increased.

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 28 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 could 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. Ahmed and Arabi (2016) investigated the underground economy in Sudan using Tanzi model and data spanning from 1990 to 2014 which were sourced from Central Bureau of Statistics and Central Bank of Sudan. The results had it that the modified Tanzi model used for the study was suitable and that the underground economy was estimated to be 16.5% of bank service and 20.2% of Sudan GDP.

Nchor, 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 could be 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) continued the study on the impact of the informal sector activities on economic growth in Nigeria using a data set from 1980 to 2014. The study found that the informal sector impacted on economic growth positively and recommended that the sector should be formalized and taxed accordingly in order to improve tax revenue in the country. However, this suggestion can be possible if only the tax system in Nigeria could be improved and the unnecessary tax burdens taken away to enable enterprises that are doing legitimate businesses

comply with their tax obligations.

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 underground economy was about 14.148% of GDP in 2012. Goel, Saunoris and Schneider (2017) carried out a long term study using neo-classical growth model and new time-series technique to determine the effect of the underground economy on United States economic growth from 1870-2014. The findings disclosed that shadow economy had a negative impact on economic growth prior to World War Two (WW11); then considering the post WW11, the results showed that shadow economy was beneficial for growth.

Hassan (2017) considered the effect of shadow economy on foreign aid and economic development in Egypt using data that covered a period from 1976 to 2013 and Fully Modified Ordinary Least Squares (OLS) method. The foreign aid Egypt received from US among others amounted to USD76 Billion from 1948-2015 (Hassan, 2017). The foreign aid were used to improve democracy, education, governance, health care services and enhance economic development (Sharp, 2017). However, Hasan (2017) found evidence that shadow economy had impacted on Foreign aid and economic development in Egypt negatively due to its diminishing effect on the effectiveness of the foreign aid received. 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 the Nigeria's nominal GDP.

Reilly and Krstic (2017) appreciated the direct approach used by Putnins and Sauka (2015) and applied same to investigate the size of shadow economy in two EU member countries of South-east Europe which are Montenegro and Serbia. The study also analyzed other factors influencing companies' involvement in a shadow economy. The study found evidence that shadow economy had a significant share in the official GDP of Montenegro and Serbia. When compared with the Baltic countries studied by Putnins and Sauka (2015), the unreported employee earnings of the Montenegro and Serbia were higher and about two-thirds of the shadow economy were attributed to unreported wages while one-third were attributed to unreported business income. However, these two studies made use of direct approach which involved the use of questionnaire, interviews and opinion sampling. This approach might not be effective in some countries where people seem to be economical with the truth and unwilling to give responses to the research instrument (questionnaire). Also, in countries where corruption is the order of the day, it may be difficult to obtain a reliable information from company managers. Besides, the integrity of these company managers and the credibility of the information coming from them must be tested before placing reliance on them.

Chen and Schneider (2018) focused their study on China's shadow economy from 1978 to 2016 using two models and China's economic background. The findings revealed that shadow economy increased from 18.44% in 1978 to 32.16% in 1989 before decreasing to 4.27% in 2016. The major drivers of shadow economy in China identified by the study included total tax burden, level of employment in the primary sector, regulation intensity and fiscal decentralization. However, the findings further indicated that the statistical impact of regulation and employment in the primary sector were strong and significant in the long term. Medina and Schneider (2018) extended the study on shadow economy using 158 countries across the world and covering a period from 1991 to 2015. The study focused on determining the average size of shadow economy of the 158 countries and it was 31.9 per cent for the period. The countries that had the highest percentage of shadow economy in their GDP were Zimbabwe and Bolivia having 60.6% and 62.3% respectively. The lowest were Austria and Switzerland having 8.9% and 7.2% respectively.

Guillermo and Deyvi (2018) studied the impact of 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.

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Remeikiene *et al.* (2018) considered 19 Eurozone member states from 2005 to 2016 using MIMIC approach which revealed that employment rate, gender wage gap and income inequalities were the determining factors of shadow economy. The study also found that the level of the shadow economy would determine if the degree of public trust in EU authorities would be positive or negative. The study encouraged the public authorities to combat the shadow economy causal factors and indicators in order to achieve its reduction. Goel, Saunoris and Schneider (2019) went further to analyze the major determinants of the underground economy in the US for over a century ranging from 1870 to 2014. The study found evidence that while inflation and prosperity were statistically insignificant, bigger government and greater trade openness decreased shadow economy. It was also discovered that US underground economy increased during the World War 11, but the World War 1 had an insignificant effect but the severe depression reduced the shadow economy. However, the study established that the addition of new states to the Union made a positive impact on shadow economy.

2.4 Research gap

Several studies have been considered in this work, however the present study is focusing on the financial and economic implications of underground economy with particular emphasis on Nigeria. Despite the contribution of the shadow economy to Nigeria's economic growth as established by Yelwa and Adam (2017) which implies that the economic implication of the underground economy is positive, this study tries to go beyond the contribution of the informal economy to nominal GDP by determining the tax revenue earned and the tax revenue lost by the government as a result of informal economy activities. The formal economy produces the tax revenue earned by the government, while the tax revenue loss suffered by the government is caused by the operations of the informal sector. Therefore, the two scenarios are weighed to actually establish the financial and economic impacts of the shadow economy on the economy. This is the gap this study is filling and what differentiates it from similar studies. The computations that established the tax revenue earned and lost can be found on table 1 below.

3. Methodology

3.1 Research Design

This research adopted an ex-post facto research design in order to realize the objectives of the study. This research design is relevant in this study because it requires the use of time series data already captured in a recognized international and domestic official statistical archive. The study also employed the ordinary least squares (OLS) multiple regression technique for analysis due to its simplicity and clarity of statistical evidence. This research instrument is necessary because the selected research area for investigation is analytical, empirical and quantitative in nature.

3.2 Types and Sources of Data Collection

In other to analytically produce an empirical evidence in this research, time series data relating to the dependent and explanatory variables have been employed which cover a period from 1991 to 2018. The shadow economy used in determining the tax revenue loss is a percentage of the Nominal GDP of Nigeria (See table 1) while the tax revenue earned and the GDP have been gathered from the CBN Statistical Bulletin. All the data are expressed in billions of Naira (local currency). The level of significance chosen for this study is 10%, thus the individual result of the variables will be significant at 10%. All the data employed in this study were obtained from the Central Bank of Nigeria Statistical Bulletin, Federal Inland Revenue Service and the International Monetary Fund.

3.3 Model Specification

The functional and econometric association between the dependent variable and the independent variables can be observed in the equations below:

$$GDP = f (TRVE, TRVL) \dots\dots\dots (1)$$

$$GDP = \beta_0 + \beta_1 TRVE + \beta_2 TRVL + \mu \dots\dots\dots (2)$$

Where: GDP = Gross Domestic Product; TRVE = Tax Revenue Earned; TRVL = Tax Revenue Loss; β_0 = Constant; β_1 - β_2 = Regression coefficients; μ = Error term.

On the a priori, we expect; $\beta_1 > 0$, $\beta_2 < 0$.

4. Data Analysis and Interpretations

Table 1: Computation of shadow economy and tax revenue loss from 1991-2018

YEAR	GDP (SDY+FME)	SHADOW ECONOMY (SDY)	SDY % OF GDP	FME (GDP-SDY)	TRVE NON-OIL REVENUE	TRVL (TRVE/FME)*SDY
	N'BILLIONS	% OF GDP	N'BILLIONS	N'BILLIONS	N'BILLIONS	N'BILLIONS
1991	596.04	56.95	339.39	256.65	18.33	24.24
1992	909.8	58.17	529.23	380.57	26.38	36.68
1993	1,259.07	58.82	740.58	518.49	30.67	43.81
1994	1,762.81	66.61	1,174.21	588.60	41.72	83.23
1995	2,895.20	62.21	1,801.10	1,094.10	135.44	222.96
1996	3,779.13	61.09	2,308.67	1,470.46	114.81	180.26
1997	4,111.64	60.69	2,495.35	1,616.29	166	256.28
1998	4,588.99	62.33	2,860.32	1,728.67	139.3	230.49
1999	5,307.36	59.87	3,177.52	2,129.84	224.77	335.33
2000	6,897.48	57.9	3,993.64	2,903.84	314.48	432.50
2001	8,134.14	57.64	4,688.52	3,445.62	903.46	1,229.35
2002	11,332.25	59.93	6,791.42	4,540.83	500.99	749.30
2003	13,301.56	57.19	7,607.16	5,694.40	500.82	669.05

2004	17,321.30	56.72	9,824.64	7,496.66	565.7	741.37
2005	22,269.98	55.84	12,435.56	9,834.42	785.1	992.75
2006	28,662.47	51.95	14,890.15	13,772.32	677.54	732.53
2007	32,995.38	54.96	18,134.26	14,861.12	1,264.60	1,543.13
2008	39,157.88	53.06	20,777.17	18,380.71	1,336.00	1,510.19
2009	44,285.56	53.98	23,905.35	20,380.21	1,652.65	1,938.51
2010	54,612.26	52.8	28,835.27	25,776.99	1,907.58	2,133.90
2011	62,980	51.51	32,441.00	30,539.00	2,237.88	2,377.26
2012	71,713.94	51.56	36,975.71	34,738.23	2,628.78	2,798.10
2013	80,092.56	51.7	41,407.85	38,684.71	2,950.56	3,158.26
2014	89,043.62	50.64	45,091.69	43,951.93	3,275.03	3,359.96
2015	94,144.96	52.49	49,416.69	44,728.27	3,082.41	3,405.51
2016	101,489.49	48.37	49,090.47	52,399.02	2,985.13	2,796.64
2017	113,711.63	65.01	73,923.93	39,787.70	3,207.90	5,960.15
2018	116,099.57	65.04	75,511.16	40,588.41	5,300.00	9,860.18
TOTAL	1,033,456.07		571,168.01	462,288.06	36,974.03	47,801.92

Source: CBN Statistical Bulletin 2017 Edition, Firs 2018 Report, IMF Working Paper 2018 and Author's Calculations Based On The Data Collected

The computation on table 1 above shows the data value used in this study. The abbreviations applied in table 1 include: GDP (Gross Domestic Product), SDY (Shadow Economy), FME (Formal Economy), TRVE (Tax Revenue Earned), TRVL (Tax Revenue Loss). Therefore, from table 1 above, it can be observed that from 1991-2018 covered by this study, the contribution of the underground economy also known as shadow economy to the GDP (which is N1,033,456.07 Billion) amounts to N571,168.01 Billion while the formal economy contributes about N462,288.06 Billion. This again confirms that the economic implication of the underground economy to Nigeria's economic growth is positive (Yelwa & Adam, 2017; IMF, 2017). However, table 1 above also highlights the tax revenue earned (TRVE) from the formal economy and the tax revenue lost (TRVL) to shadow economy due to undisclosed business incomes and wages. The tax revenue earned (TRVE) by the government from 1991-2018 based on the calculation on table 1 above has been estimated to be about N36,974.03 Billion while the tax revenue loss (TRVL) is assessed to be about N47,801.92 Billion. The financial implication of shadow economy in Nigeria is that, the government losses more revenue via the operations of the underground economy despite the positive contribution of its activities to economic growth. See below the graphical justification.

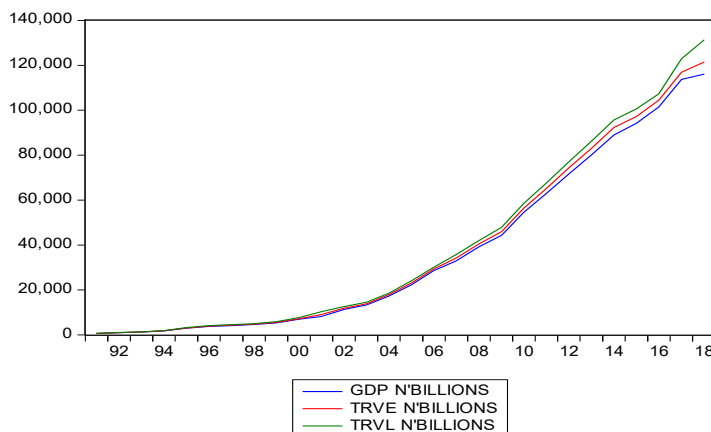


Figure 1: Trend of data in a graph

Source: CBN Statistical Bulletin 2017 Edition, FIRS 2018 Report and IMF Working Paper 2018.

Table 2: Regression result

Dependent Variable: GDP_N_BILLIONS
Method: Least Squares
Date: 02/23/19 Time: 15:04
Sample: 1991 2018
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRVE_N_BILLIONS	33.82610	3.662534	9.235708	0.0000
TRVL_N_BILLIONS	-4.655988	2.378151	-1.957819	0.0615
C	190.5052	2443.419	0.077967	0.9385
R-squared	0.948924	Mean dependent var		36909.15
Adjusted R-squared	0.944838	S.D. dependent var		38767.51
S.E. of regression	9105.159	Akaike info criterion		21.17203
Sum squared resid	2.07E+09	Schwarz criterion		21.31476
Log likelihood	-293.4084	Hannan-Quinn criter.		21.21566
F-statistic	232.2341	Durbin-Watson stat		1.841007
Prob(F-statistic)	0.000000			

Source: Author's computation, 2019.

Table 2 above gives the regression result of the impact of the tax revenue earned and the tax revenue loss on economic growth represented by the GDP. This result gives more insight into the financial implication of the shadow economy on the economy of Nigeria. From table 2 above, the correlation (R) value is 97.4% (square root of R-squared) which implies that the TRVE, TRVL and GDP have very strong association. Similarly, the R-squared which is 94.9% indicates that TRVE and TRVL are responsible for the changes in the GDP up to that magnitude while the residual which is 5.1% goes for other variables the model does not recognize. The Durbin-Watson is 1.8 of which if approximated is 2, thus, it shows absence of auto-correlation in the sample. In the same manner the F-statistic has the value of 232.2341 and the p-value of $0.000 < 0.10$. In other words, the value is significant at 1% which is less than 10%, therefore, the model is a good fit and all the independent variables jointly influence the response variable.

The TRVE t-statistics is 9.235708 and the p-value is $0.000 < 0.10$. This result means that TRVE is significant at 1% which is less than 10%. The implication is that tax revenue earned has a strong positive and significant impact on economic growth of Nigeria. Thus, the a priori expectation is fulfilled by this result. Considering the TRVL, the t-statistics is -1.957819 while the p-value is $0.06 < 0.10$. This result shows that the TRVL has a significant negative impact on economic growth of Nigeria. That means the a priori expectation is met by this result. In other words, the financial effect of shadow economy on economic growth of Nigeria is really devastating as the government loses tax revenue and the impact of the loss is negatively influencing the entire economic system.

5. Conclusion

The outcome of this study has led to some vital conclusions that the contribution of the shadow economy to economic growth is a mere sham since the government loses more revenue than it earns. Besides, the government depends on tax revenue to adequately provide infrastructures for the citizens. The lack of tax morality among the participants of the underground economy in Nigeria is a very big concern because they also benefit from public goods and services provided by the government.

6. Recommendations

- Based on the foregoing, the study recommends that the government should endeavor to relax some business regulations that prompt the private businesses to go into hiding, thereby not disclosing their income that should be subject to tax. The same condition should apply to tax laws that are too complex and intimidating. The tax payers should be encouraged to comply with their obligations to the government through improvement on tax laws and administration.
- Tax collection mechanism in Nigeria requires a complete overhauling to make it difficult for tax collectors to divert revenues collected into their private pockets.
- The government is encouraged to create a friendly business environment as well as finding a way to ensure that all legitimate shadow economy activities are taxed to prevent tax revenue losses. In order to achieve this objective, corruption should be curbed, if possible eradicated among the government officials involved in the service of checking the shadow economy activities and ensuring that tax payment is complied with.
- The study is also suggesting that all legal economic activities should be taxed, while the illegitimate ones should be stopped. These illegal shadow economy activities may be criminal activities and some other activities that pose threat to lives and properties, the government should not allow them to operate all. There should be enough security intelligence to combat them and seize their operation by all means, no matter the hiding.

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