Currency Demand, the Underground Economy and Tax Evasion: The Case of Nigeria

Ademola Ariyo and William Bekoe

ABSTRACT

The existence of a large underground economy in Nigeria is an important consequent of economic and social policy over the period 1975-2010. However, empirical evidence on the severity of the underground economy and its relationship with tax evasion and the official economy is very scanty. This study seeks 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 this period. 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 42.34% – 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 are the driving forces behind the growth in the underground economy and tax evasion. Minimisation of the size of the underground economy is necessary for effectively addressing the problem of tax evasion in the country. The study, therefore, recommends that government should evolve perhaps towards monetisation of the economy and the evaluation of an optimal tax system.

Key words: Underground economy, Tax evasion, currency demand approach, Nigeria

INTRODUCTION

Over the past two decades a growing concern over the phenomenon of the shadow economy has engaged the attention public officials, politicians and social scientists. For many countries including Nigeria, there are several important reasons, why politicians have become concerned about the size and growth of the underground economy. 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

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19 Also known as the hidden, parallel, second, cash, shadow, black, informal economy.
out of the market and also provide a haven for criminal activities including tax evasion. Underground economic activities distort the quality of macroeconomic statistics (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. Finally, 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.

Schenieder (2007) in his study for developing countries estimated the size for the underground economy in Nigeria for 2000, 2001 and 2002 to be growing in size of about 57.9, 58.6 and 59.4 percent of GDP respectively. This upward trend has become a growing concern to policy makers and economist because an increase in the size of the underground economy will increase the demand for currency (Cagan 1958; and Tanzi 1980, 1983). The need to have an accurate measure of the underground economy can therefore not be questioned nor doubted.

This notwithstanding, empirical evidence on the severity of the underground economy and its relationship with the tax evasion and the official economy in Nigeria is very scanty. Most of the studies on the underground economy are limited mostly to developed countries and a few ones such as Osoro (1995), Schneider (2007) Faal (2003) devoted to the developing world. This study, therefore seeks 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.

A review of the literature reveals that Schneider and Enste (2000) and Schneider (2005, 2007) are some of the few studies that attempted to estimate the size of the underground economy in Nigeria. However, this study differs from such earlier studies on Nigeria for two important reasons. First, the study employs a modified econometric version of Tanzi’s (1983) currency demand approach and an error correction model (ECM) to derive estimates of the underground economy and tax evasion. Second, the study extends the time series data to cover 1975 to 2010.

The rest of the paper is organized as follows: Section II discusses some of the salient features of the underground economy in Nigeria. Section III reviews the relevant literature. Section IV will be preoccupied with the model of the study; whereas Section V

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20 Tax evasion is the situation where individuals or business entities decide not to fully honour their tax obligations via non-declaration or under declaration of taxable economic activities. In fact tax evasion includes any action that results in the concealment of, or part of a person’s legitimate or illegal economic activities from tax authorities in order to avoid payment of direct or indirect taxes. It is an illegal action.
will be concerned with the time series estimates of demand for currency holdings and estimates for the underground economy and tax evasion. Section VI concludes the paper with recommendations on how to reduce the underground economy.

**THE UNDERGROUND ECONOMY IN NIGERIA**

Gathering information about the underground economy in Nigeria is difficult since no one engaged in the sector wants to be identified. Yet, available evidence tends to suggest that the participation in the underground economy in Nigeria became widespread in the immediate years after political independence and the 1970s for several reasons.

First, during the 1960s to early 1970s, tax policy in the country was aimed at maximizing revenue generation to finance public sector programmes in order to meet the accelerated economic growth and development agenda of the government. Attention was therefore directed at increasing the existing tax rates (especially import duties) in the form of high protective tariffs, as a consequence import duties provided the bulk of federal government revenue in the early 1960s (Phillips, 1991). Such direct restrictions on imports and the distortions introduced by quantitative restrictions and tariffs resulted in a highly protected domestic market with a high cost structure. The excessive interference from the state in the economy and the overvalued currency in the official foreign exchange market led to favourable conditions for the rapid growth of rent seeking activities and the institutionalization of the underground economy. Second, the Nigerian economy witnessed tremendous economic crisis during the 1980s, which caused a further widespread in the underground economy. Beginning from mid-1981, the world oil market began to collapse due to the oil glut, and with it, an economic crisis emerged in the country. The national government therefore started the prioritisation of projects, giving its declining revenue levels. Also, in response to the economic crisis at the time, the government changed from a state-led to market driven economy. As a result the government could no longer provide employment opportunities as it did during the oil boom era (Ademu, 2007). This situation, coupled with the effects of some domestic policies led to high unemployment in the economy.

In particular, the adoption of the Structural Adjusted Programme (SAP) in 1986, stifled the performance of most sectors of the economy, thereby forcing most sectors like the industrial sector to downsize. Also the privatization programme by the federal government coupled with the rationalization of the workforce by various levels of government, have rendered most people jobless. Finally, the massive turnout of graduates from the tertiary institutions, without corresponding expansion in jobs, has left many of these graduates unemployed. In response to the lack of employment opportunities within the formal sector, the underground economy becomes the sponge that absorbs the “excess labour force”. Labour in this sector mainly engage in activities that are generally small –scale in nature, relying on indigenous resources and skills
acquired through informal means; they are labour intensive and operate outside the regulated market. Employment opportunities in this sector ranges from street vending, petty trading, food vending, artisan and craft workers, transport, personal services (such as mechanics and tailoring etc.), security services, prostitution and crime to small-scale businesses. This structure of activities is evident in Table 1 below and reveals the nature of the informal sector in the Nigerian economy.

Table 1: Percentage Distribution of Informal Non-Manufacturing Enterprises by Activity/ Sector

<table>
<thead>
<tr>
<th>Activity/Sectors</th>
<th>1 Person</th>
<th>2 Persons</th>
<th>3 Persons</th>
<th>4 Persons</th>
<th>5 Persons</th>
<th>6-10 Persons</th>
<th>20 Persons</th>
<th>20+ Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>81.1</td>
<td>10.2</td>
<td>4.4</td>
<td>2.0</td>
<td>0.9</td>
<td>1.1</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Water supply</td>
<td>87.9</td>
<td>6.0</td>
<td>3.0</td>
<td>0.9</td>
<td>1.3</td>
<td>0.4</td>
<td>0.4</td>
<td>-</td>
</tr>
<tr>
<td>Building &amp; Construction</td>
<td>73.5</td>
<td>8.9</td>
<td>6.5</td>
<td>4.6</td>
<td>2.4</td>
<td>3.2</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Wholesales &amp; Retails Trade</td>
<td>83.5</td>
<td>9.4</td>
<td>3.6</td>
<td>1.7</td>
<td>0.8</td>
<td>0.9</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Repair of Motor Car/Cycles</td>
<td>71.8</td>
<td>10.2</td>
<td>10.3</td>
<td>3.8</td>
<td>1.8</td>
<td>1.7</td>
<td>0.5</td>
<td>-</td>
</tr>
<tr>
<td>Hotel &amp; Restaurants</td>
<td>66.2</td>
<td>19.1</td>
<td>10.5</td>
<td>2.3</td>
<td>0.8</td>
<td>1.0</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Transport, Land &amp; Water</td>
<td>77.2</td>
<td>16.6</td>
<td>2.9</td>
<td>1.9</td>
<td>0.2</td>
<td>0.7</td>
<td>0.2</td>
<td>-</td>
</tr>
<tr>
<td>Financial Inter-mediate</td>
<td>60.0</td>
<td>20.0</td>
<td>20.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Real Estate/Renting</td>
<td>82.2</td>
<td>9.9</td>
<td>5.9</td>
<td>0.7</td>
<td>0.7</td>
<td>-</td>
<td>-</td>
<td>0.7</td>
</tr>
<tr>
<td>Education</td>
<td>65.8</td>
<td>3.9</td>
<td>6.6</td>
<td>6.6</td>
<td>1.3</td>
<td>7.9</td>
<td>5.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Health &amp; Social Work</td>
<td>76.0</td>
<td>12.0</td>
<td>5.3</td>
<td>1.8</td>
<td>2.1</td>
<td>2.8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other Community/ Social Services</td>
<td>79.2</td>
<td>11.0</td>
<td>4.3</td>
<td>2.3</td>
<td>1.2</td>
<td>1.4</td>
<td>0.5</td>
<td>-</td>
</tr>
</tbody>
</table>


It is evident from Table 1 that for all manner of employment levels, the wholesales and retails trade sub-sector is the leading employer of labour within the informal sector. Other equally important sub-sectors in this regard include: repair of motor car/cycles, building and construction, water supply, health and social work and education. Table 2 also show the same pattern of distribution with regards to the category of workers employed in the underground economy.
Table 2: Distribution of Informal Non-Manufacturing Enterprises by Activity/Sector and Category of Workers

<table>
<thead>
<tr>
<th>Activity/Sectors</th>
<th>Total No. of Estab.</th>
<th>Category/Total number of workers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Owner of Business</td>
<td>Paid Employee</td>
</tr>
<tr>
<td>Total</td>
<td>6,492,886</td>
<td>7,266,193</td>
</tr>
<tr>
<td>Water supply Building &amp; Construction</td>
<td>50,701</td>
<td>126,309</td>
</tr>
<tr>
<td>Repair of Motor Car/Cycles</td>
<td>328,487</td>
<td>408,081</td>
</tr>
<tr>
<td>Transport, Land &amp; Water</td>
<td>182,041</td>
<td>203,581</td>
</tr>
<tr>
<td>Financial Intermediate</td>
<td>2,445</td>
<td>2,844</td>
</tr>
<tr>
<td>Real Estate/Renting</td>
<td>40,094</td>
<td>42,354</td>
</tr>
<tr>
<td>Education</td>
<td>18,552</td>
<td>36,932</td>
</tr>
<tr>
<td>Health &amp; Social Work</td>
<td>70,278</td>
<td>82,697</td>
</tr>
<tr>
<td>Other Community/Social Services</td>
<td>570,868</td>
<td>653,552</td>
</tr>
</tbody>
</table>


Finally, with regards to educational qualification of workers within the informal sector in Nigeria, Table 3 reveals that if the data for building and construction is added to real estate/renting, then these sub-sectors will showcase one of the best educationally qualified workers countrywide. It is also evident from the table however that, the wholesale/retail trade sub-section attracts the highly educated labour force in the entire country.
Table 3: Distribution of Informal Non-Manufacturing Enterprises by Activity/Sector and Educational Qualification of Workers

<table>
<thead>
<tr>
<th>Activity/Sectors</th>
<th>Total No. of Estab.</th>
<th>Degree</th>
<th>WASC</th>
<th>Primary Education</th>
<th>Formal Education</th>
<th>Non-Formal Education</th>
<th>No Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>6,492,886</td>
<td>95,465</td>
<td>2,009,170</td>
<td>3,019,362</td>
<td>70,637</td>
<td>146,402</td>
<td>3,635,177</td>
<td>8,967,412</td>
</tr>
<tr>
<td>Water supply Construction</td>
<td>90,701</td>
<td>665</td>
<td>26,583</td>
<td>15,950</td>
<td>1,329</td>
<td>5,981</td>
<td>93,707</td>
<td>144,215</td>
</tr>
<tr>
<td>Wholesales &amp; Retail Trade</td>
<td>4,783,639</td>
<td>52,035</td>
<td>1,315,749</td>
<td>2,013,725</td>
<td>48,905</td>
<td>103,288</td>
<td>2,752,000</td>
<td>6,285,702</td>
</tr>
<tr>
<td>Repair of Motor Cars/Cycles</td>
<td>328,487</td>
<td>1,642</td>
<td>166,657</td>
<td>236,439</td>
<td>3,694</td>
<td>7,389</td>
<td>126,840</td>
<td>542,661</td>
</tr>
<tr>
<td>Hotel &amp; Restaurants</td>
<td>182,401</td>
<td>1,756</td>
<td>66,222</td>
<td>104,665</td>
<td>2,728</td>
<td>4,712</td>
<td>104,664</td>
<td>284,728</td>
</tr>
<tr>
<td>Transport, Land &amp; Water</td>
<td>150,794</td>
<td>1,147</td>
<td>47,317</td>
<td>92,628</td>
<td>3,441</td>
<td></td>
<td>67,965</td>
<td>213,072</td>
</tr>
<tr>
<td>Financial Intermediary</td>
<td>2,445</td>
<td>-</td>
<td>1,826</td>
<td>1,565</td>
<td>-</td>
<td>-</td>
<td>522</td>
<td>3,912</td>
</tr>
<tr>
<td>Real Estate/Renting</td>
<td>40,094</td>
<td>10,076</td>
<td>12,267</td>
<td>19,057</td>
<td>219</td>
<td>-</td>
<td>12,267</td>
<td>53,886</td>
</tr>
<tr>
<td>Education</td>
<td>18,952</td>
<td>6,569</td>
<td>28,902</td>
<td>8,211</td>
<td>1,314</td>
<td>1,314</td>
<td>10,510</td>
<td>56,818</td>
</tr>
<tr>
<td>Health &amp; Social Work</td>
<td>70,278</td>
<td>3,456</td>
<td>32,964</td>
<td>32,433</td>
<td>2,127</td>
<td>2,127</td>
<td>33,496</td>
<td>107,666</td>
</tr>
<tr>
<td>Other Community/Social Services</td>
<td>570,868</td>
<td>8,790</td>
<td>228,838</td>
<td>292,713</td>
<td>12,306</td>
<td>12,306</td>
<td>280,114</td>
<td>828,329</td>
</tr>
</tbody>
</table>


LITERATURE REVIEW

This section reviewed the relevant theoretical and empirical literature on currency demand, the underground economy and tax evasion. The importance of this review is to provide a strong foundation for the empirical model employed for the study.

THEORETICAL LITERATURE

The operations of the informal sector form a considerable part of the problems that tax authorities face in dealing with tax evasion. In fact tax evasion thrives both in the formal and the informal sectors of economies. The difference however, is in the nature of the problem and therefore the nature of the approaches for dealing with the problem in the two sectors. Dealing with it in the underground economy is usually regarded as more challenging.

According to Fiege (1979) the underground economy include all unreported activity that are not unmeasured by “society’s current techniques for monitoring economic activity”. In the view of Smith (1994) the underground economy is the “market based production of goods and services, whether legal or illegal that escapes the official estimates of GDP”. Thus the underground economy is very broad and may include both legal
activities such as unreported income that would normally be reported in GDP and illegal activities including smuggling, fraud, prostitution and money laundering. Tokman and Klien (1996) rather defines it as the part of the economy where economic activities largely take place outside the established regulatory authorities, so that it is common to find businesses operating without licenses and regulations. On the other hand, Aryeetey and Codjoe (2005) broadly defined informal economic activities as those enterprises that for various reasons have their output unrecorded in the national accounts, though their size is relatively large. It is thus an unofficial sector of underground economic activities beyond government regulation and taxation. The kind of economic activities that would be considered informal include small-scale enterprises and their employees, self-employed persons engaged in the production of goods and services, commerce, transport, food processing and so on. Baah-Nuakoh (2003) also observed that most of the activities in the informal sector are not specific to that sector; they spill over to the formal sector as well.

In spite of the difficulty in providing an appropriate definition, several studies have viewed the underground economy in different ways. Some have viewed the informal sector as an employment provider, where as others view it as a breeding ground for indigenous entrepreneurship, or a refuge for those who have migrated from rural to urban environment for formal employment but have been unable to secure one (Baah-Nuakoh, 2003; Aryeetey and Codjoe, 2005). Ninson (1991) however, described the underground economy as the dumping ground for unemployed labour, especially during periods of severe economic crisis. The underground economy is regarded as operating outside the regulatory framework partly because of inadequate legislation and inefficient bureaucracies.

Studies on tax evasion on the other hand started with the seminal theoretical models derived by Allingham and Sandmo (1972) and Srinivasan (1973), which were in turn based on Becker's (1968) economic approach to crime. The Allingham and Sandmo model analyzed the evasion decision of an individual as a choice under uncertainty. The model assumed a taxpayer with exogenous income of \( y \) subject to a tax rate of \( \tau \) on his income. The decision of the taxpayer is to either report full income \( y \), or to hide an income of \( c = y - x \). There is however a probability of \( p \) that the taxpayer will be audited. If he is caught evading tax he pays a penalty at the rate of \( f \) on the unreported income in addition to the tax. Thus their model sought to measure the effects of tax rates, detection probabilities, and penalty level on the utility gained by under-reporting taxable income. In general, the models predict that tax evasion is decreasing in detection risk and penalty levels and increasing in tax rates. However, the relationship between the amount of unreported income and actual income of the taxpayer is ambiguous. Alligman and Sandmo showed that the relationship depends only on the relative risk aversion of the taxpayer's utility function. Such that, when actual income varies, the fraction of income...
not declared decreases (increases) if the relative risk aversion is an increasing (decreasing) function of income.

Subsequent studies have extended and generalized the Allingman and Sandmo model in a number of ways. The study by Fishburn (1981) was the first to introduce an extension into the seminal theoretical models by relating tax evasion and macroeconomic factors. Specifically the study analyzed the effect of inflation on the level of tax evasion. One way inflation can affect the decision to evade taxes is by eroding the real value of a given level of nominal disposable income. Tax evasion is therefore seen as the means for restoring taxpayer's purchasing power. Fishburn's results showed that a risk-neutral individual's evasion decision is independent of the price level, while that of a risk-averse individual depends on the properties of the relative risk-aversion function. In particular, the observed proportion of true income unreported by a risk-averse individual is a non-decreasing (non-increasing) function of the price level if relative risk aversion is an increasing (decreasing) function of income. Another way inflation can affect tax evasion is through tax bracket creep. Since most tax systems are not indexed, higher inflation pushes taxpayers into higher tax brackets even though their income is adjusted with cost of living index changes.

The study by Fugazza and Jacques (2003) added to the literature on the relationship between tax evasion and labour supply by employing a continuous-time matching model with searching costs. Individuals select the sector in which they are going to supply labour based on expected costs and benefits of the relative sector. The model also allows for labour market policies, such as unemployment insurance and minimum wage setting. They find that increased tax rates and increased evasion detection rates may lead to an increase in participation in the formal labour market. However, there are multiple equilibria possible in the model. The ultimate mix of effects is determined by whether the policy environment is one of a ‘low employment’ equilibrium or a ‘high employment’ equilibrium and by the government policy toward deficits (whether a balanced budget must be maintained).

Meanwhile, the determinants for a household to work in the underground economy have been found to be similar to those of tax evasion as discussed by Allingham and Sandmo (1972). Neck, Hofreither and Schneider (1989), developed a micro economic model of underground economic activities to investigate the determinants of a household’s supply of underground labour and its demand for underground goods. Among other results, they showed that, at least under an additive-separable utility function and with a two-stage decision of the consumer, higher marginal income tax rates imply a higher supply of underground labour, and higher wage rates in the official economy imply a lower supply of underground labour. On the other hand, they showed that firms’ demand for underground labour and supply of underground goods depend positively on the indirect tax rate and on the wage rate in the official economy, at least under the assumption of
fixed non-human factors of a production and separate production functions for official and underground goods.

**EMPIRICAL LITERATURE**

The currency demand approach was first used by Cagan (1958) to calculate a correlation of the currency demand and the tax rate (as a major cause of the underground economy) for the United States over the period 1919 to 1955. His argument was that since currency gives anonymity to tax evasion activities, taxpayers use currency rather than other methods of payment such as cheques. Thus, as the tax burden increases, tax evasion increases and hence the demand for currency relative to broader money (M2) increases. To test his hypothesis, Cagan regressed the currency to M2 ratio on the tax rate, interest rate, and income. Cagan’s approach was further developed by Tanzi (1980, 1983), who econometrically estimated a currency demand function for the United States for the period 1929 to 1980 in order to calculate the underground economy. His approach assumes that underground transactions are undertaken in the form of cash payments, so as to leave no observable traces for the authorities. An increase in the size of the underground economy will therefore increase the demand for currency.

The currency demand approach has been applied to many OECD countries to estimate the underground economy. Matthews (1982) studies the effect of the income tax rate and the VAT rate on the ratio of cash to demand deposits in the United Kingdom, and by using this relationship he calculates the underground economy for the U.K. at about 7.5 percent of GNP. Klovland (1984) also tests the effect of marginal tax rates on the currency demand for Norway and Sweden. While the estimations for Sweden corroborate the positive effect of marginal tax rate on currency holdings, he does not find such effects for Norway. For Sweden he calculates the hidden economy to be between 3 and 20 percent of GDP, depending on the different specification estimated and the tax rate definition used. Other studies that employ the currency approach for OECD countries, include Bajada (1999) for Australia, Giles (1999) for New Zealand and Schneider (2002, 2005, 2007; Schneider and Enste 2000) for 21 OECD countries.

Using the DYMIMIC (Dynamic Multiple-Indicators Multiple -Causes) model and the currency demand approach Schneider’s (2007) study provides estimates of the underground economy in 145 countries comprising developing, transition, highly developed OECD, Pacific Islands and Communist countries for the periods 1999/2000, 2001/2002 and 2002/2003. The results showed that the average size of the shadow economy (as a percentage of GDP) over the 2002/2003 in developing countries is 39.1%, in transition countries, 40.1%, in OECD countries, 3%, South Pacific islands, 33.4% and Communist countries it is 21.8%. The figures show an upward trend from the 1999/2000 period’s average size of 33.9%, 31.5%, 13.2% 31.7% and 19.4% for the respective countries. An increasing burden of taxation, high unemployment and low official GDP growth were found to be the forces driving the underground economy.
The strong influence of indirect and direct taxation on the shadow economy has further been demonstrated by empirical studies by Schneider (1994b) for Austria and the Scandinavian countries. In this study Schneider estimated a currency demand function including as driving forces for the underground economy the following four types of variables: the burden of total direct taxation, the burden of indirect taxation, the complexity of the tax system and the intensity of government regulations. The estimated coefficient of the independent variable, direct tax burden (including social security payments), has the biggest influence, followed by the intensity of regulation and complexity of the tax system on the currency demand. A similar result has been found by Schneider (1986) for Scandinavia (Denmark, Norway and Sweden). In all three countries various tax variables (average direct tax rate, average total tax rate (indirect and direct tax rate)) and marginal tax rates have the expected positive direction of influence (on currency demand) and are highly statistically significant. Similar results are reached by Kirchgaessner (1984) for Germany and by Klovland (1984) for Norway and Sweden.

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.

On the intensity of regulations, the literature reveals that an increase of the intensity of regulations (often measured in the numbers of laws and regulations, like licenses requirements) is another important factor which reduces the freedom for individuals engaged in the official economy. Factors such as labour market regulations, trade barriers, and labour restrictions for foreigners are instances of such regulations. The influence of labour regulations on the shadow economy is clearly described and theoretically derived in studies, for instance in Germany (see, Monopolkommission 1998). Regulations lead to a substantial increase in labour costs in the official economy. But since most of these costs can be shifted on the employees, these costs provide another incentive to work in the underground economy, where they can be avoided.

Empirical evidence by Johnson, Kaufmann and Shleifer (1997), further predicts that countries with more general regulation of their economies tend to have a higher share of the unofficial economy in total GDP. A one-point increase of the regulation index (ranging from 1 to 5, with 5 = the most regulation in a country), ceteris paribus, is
associated with an 8.1 percentage point increase in the share of the shadow economy. They conclude that it is the enforcement of regulation, which is the key factor for the burden levied on firms and individuals, and not the overall extent of regulation. Friedman et al. (2000) reached a similar result. In their study every available measure of regulation is significantly correlated with the share of the unofficial economy and the direction of the correlation is unambiguous: more regulation is correlated with a larger shadow economy. A one point increase in an index of regulation (ranging from 1-5) is associated with a 10 percent increase in the shadow economy for 76 developing, transition and developed countries.

Finally, a review of the literature indicates that an increase of the underground economy leads to reduced state revenues which in turn reduce the quality and quantity of publicly provided goods and services. Ultimately, this can lead to an increase in the tax rates for firms and individuals in the official sector, quite often combined with a deterioration in the quality of the public goods (such as the public infrastructure) and of the administration, with the consequence of even stronger incentives to participate in the shadow economy. Johnson et al. (1998b) present a simple model of this relationship. Their findings show that smaller underground economies appear in countries with higher tax revenues, if achieved by lower tax rates, fewer laws and regulations and less bribery facing enterprises. Countries with a better rule of the law, which is financed by tax revenues, also have smaller underground economies. Transition countries have higher levels of regulation leading to a significantly higher incidence of bribery, higher effective taxes on official activities and a large discretionary framework of regulations and consequently to a higher shadow economy.

THE MODEL

The currency demand approach is a widely used approach for measuring the underground economy and hence tax evasion. This approach was first employed by Cagan (1958) to estimating the size of the underground economy for the United States over the period 1919 – 1955. Twenty years later, Gutmann (1977) and then Feige (1979) used the same approach but without any statistical procedures. Cagan’s approach was further adopted and developed by Tanzi (1980, 1983) to determine the size of the underground economy for the United States by estimating econometrically a currency demand function for the country over the period 1929 -1980.

Our estimation of the underground economy begins with the estimating currency demand model based on Tanzi’s (1983) approach. In this model, the currency to M2 ratio is expressed as a function of the tax rate, the income of the representative taxpayer, the probability of audit, the penalty rate, the interest rate, the inflation rate, consumption, urbanization and the education level. The probability of audit and the penalty rates are the two variables measuring the enforcement strength of the tax authorities. These two
variables along with the tax rate are the main variables accounting for the underground economy/tax evasion in the currency equation. However, because of the difficulties in acquiring data on the probability of audit and penalty rate in Nigeria\(^{21}\), the study concentrates on the use the tax rate as the main variable accounting for the underground economy\(^{22}\). Interest rate and inflation were used to capture the opportunity cost of holding currency. Inflation is also included to account for financial uncertainties on the currency ratio arising from instability or uncertainties in the financial sector. Cagan (1958) discusses the degree of urbanization as a potential factor affecting the currency ratio. He argues that the effect of this factor is ambiguous because there are two conflicting effects. On the one hand, urbanization causes people to trade where they are not known, which reduces the use of checks. On the other hand, the use of checks is lower in rural areas than in cities where the populace is more sophisticated. Koyame (1996) includes the level of education as additional factor in the currency equation. He argues that people are inclined to use more cheques and other saving accounts when their educational level is high. Hence, we also included education as a factor determining the currency ratio.

Thus the equation for the currency-M2 model based on Tanzi (1983) can be represented as:

\[
\ln \left( \frac{C_t}{M_{2t}} \right) = \alpha + \beta_1 \ln(TGDP_t) + \beta_2 \ln(GDPY_t) + \beta_3 \ln(HGDP_t) + \beta_4 \ln(INF_t) + \beta_5 \ln(INT_t) + \beta_6 \ln(EDU_t) + \beta_7 \ln(URPOP_t) + \epsilon_t
\]

(1)

where:

\[
\left( \frac{C_t}{M_{2t}} \right) = \text{Currency-M2 ratio},
\]

\(TGDP_t = \text{Total tax per GDP (to proxy changes in the size of the shadow economy)},\)

\(GDPY_t = \text{GDP per capita},\)

\(HGDP_t = \text{Household final consumption expenditure per GDP},\)

\(INF_t = \text{Inflation Rate (to capture the opportunity cost of holding cash)}\)

\(^{21}\)Studies that have used tax rate to account for the underground economy include: Tanzi (1980, 1983); Faal, 2003; Schneider (2000, 2005, 2007); Schneider and Enste (2004).

\(^{22}\)The omission of these variables do not affect our results significantly because according to Cagan (1958) level of the rate is the major determinant of the size of the underground economy. See also equations 1-6 below.
**$INT_t$** = Interest rate (to capture the opportunity cost of holding cash)

**$EDU_t$** = Education level (measured as educational attainment in terms of the average years of schooling for the total population over the age of 15 years);

**$URPOPT_t$** = Urbanization (measured as percentage of the population living in cities)

**$\varepsilon_t$** = Error term

By using the results from the estimated currency-M2 model, we then proceed to find estimates for the size of underground economy and tax evasion through the following steps as applied in studies such as Tanzi (1980, 1983), Schneider (2007) and Schneider and Enste (2000, 2002). First we find the amount of illegal money in the economy, followed by legal money, then, velocity of money, the underground economy and finally tax evasion as follows:

Illegal Money (IM) = \( \left( \frac{C}{M2} \right)_t - \left( \frac{C}{M2} \right)_{wt} \times M2 \)  

(2)

where:

\( \frac{C}{M2}_t \) = the currency-M2 equation with the tax rate;

\( \frac{C}{M2}_w_t \) = the currency-M2 equation without the tax rate;

**$M2$** = Broad definition of money (M1 plus time deposits)

Legal Money (LM) = \( M1 - IM \)  

(3)

where:

**$M1$** = Narrow Definition of money (currency plus demand deposits)

**$IM$** = Illegal money obtained from equation (2)

Velocity (V) = \( \frac{GNP}{LM} \)  

(4)

where:

**$GNP$** = Gross National Product

**$LM$** = Legal Money obtained from equation (3)
Underground Economy (UE) = IM * V \tag{5}

where:
IM = Illegal Money
V = Velocity of Money derived from equation (4)

Tax Evasion (TE) = UE * \left( \frac{\text{Total Taxes}}{\text{GNP}} \right) \tag{6}

where:
UE = Underground Economy derived from equation (5)
\text{GNP} = \text{Gross National Product}

**ESTIMATION TECHNIQUES**

The study employed time series analysis as the main estimation techniques. This is because of the scope of the study and the nature of variables used in analysing the currency-M2 equation.

Annual Data for the period 1975-2010 was used in estimating the currency-M2 model. Given that this model use macroeconomic variables, unit root tests were carried out to ensure that unbiased and inconsistent estimates of standard errors were avoided and hence avoiding misleading inferences. In this light the Dickey – Fuller (DF), Augmented Dickey-Fuller (ADF) and Philips- Peron tests were conducted. Cointegration tests using Engel- Granger Two – Step (EGTS) procedure was also carried out. Given that the economic series were cointegrated, their relationship was captured by an error correction model which incorporates short-run impacts as well as feedback effect to indicate the speed of adjustment to long run equilibrium (Engel and Granger 1987).

**The Augmented Dickey-Fuller (ADF) Test**

The ADF test is one of the most widely used in the literature when testing for stationarity. If we consider a \( Z \) series, the test focuses on the Dickey-Fuller equation which is given as\textsuperscript{23}:

\[
\Delta Z_t = a_0 + \gamma Z_{t-1} + a_2 t + \sum_{i=2}^{\rho} \sigma_i \Delta Z_{t-i+1} + \mu_t \tag{7}
\]

where:
a_0 = \text{Drift term};
\sigma = \text{The difference operator};

\textsuperscript{23} There are two other forms of Dickey-Fuller equations: a first form which contains only the constant, and a second form that contains neither constant or trend. But the choice made here is accounted for by the fact that this form includes the two others and it enables us to test for the presence or absence of a deterministic trend in the variables.
Equation (7) is estimated and the null hypothesis is tested (non-stationarity against the alternative hypothesis $Z$ and $a_2 < 0$ (stationary). If $Z$ is stationary after a “d” difference(s) of times, it is said that $Z$ is an order “d” integrated and we denote $Z \sim I(d)$.

**The Philips-Peron (PP) test**

This test is derived from the following general equation of the Dickey-Fuller test:

$$\Delta Z_t = \mu + \rho t + \theta Z_{t-1} + \epsilon_t$$

(8)

The PP test keeps this equation while modifying the statistics of the test directly. It is more convenient vis-à-vis specification errors; on the other hand it is less precise that ADF when the model corresponds to reality.

The next step in the analysis is to test whether there is a linear relationship between the variables of the same order of integration. This is done by cointegration tests (Granger and Newbold 1974). The cointegration procedure entails the identification of stationarity error processes on linear combination of the variables under study that is;

$$y - a - \beta X \equiv \epsilon \sim I(0)$$

(9)

where:

- $y =$ Variable being explained;
- $a =$ Constant;
- $X =$ Vector of potential explanatory variables;
- $\beta =$ Vector of the corresponding coefficients for $X$; and
- $\epsilon =$ Stationary random disturbances.

**The Error Correction Model (ECM)**

According to Granger’s theorem of representation, if variables are in a long-term equilibrium relationship, then the best short-term representation of the long-term representation is the error correction model. If we consider the $\{Y\}, \{X_i\} i = 1, \ldots, n$, series, the short-term representation equation is of the following form:
\[ \Delta Y_t = a_0 + \sum_{i=1}^{n} \sigma_i \Delta_{it} - (1 - \xi) E_{t-1} - v_i \]  

(10)

where:

- \( E \) = Remainder of the long-term estimation;
- \( \sigma_i \) = Impact or short-term elasticity;
- \((1 - \xi)\) = Extent of adjustment of \( \Delta Y \) compared with the previous period;
- \( v_i \) = Error term

A negative sign for the term \((1 - \xi)\) confirms the existence of a long-term relation of equilibrium between the variables.

**DATA SOURCES**

For the currency-M2 model, data for the dependent variable (currency to M2 ratio) was drawn from The International Monetary Fund’s International Financial Statistics (IFS) CD-ROM (2011). Currency is defined as the notes and coins held outside the banks whereas M2 consists of money plus quasi money. Tax rate is measured as total tax revenue as a percentage of GDP. It is derived from World Bank’s World Development Indicators (WDI) CD-ROM (2011). The interest rate used is the bank deposit rate. The data for the bank deposit rate was drawn from IFS CD-ROM (2011). The inflation rate is calculated as the percentage change in the price level. Consumption is measured as household consumption expenditure as percentage of GDP. Urbanization measures the percentage of population living in urban areas. The measure of the average income of the taxpayer is the per capita income in constant U.S. dollars. The data on consumption, inflation, urbanization and per capita income are drawn from the World Development Indicators CD-ROM (2011). Education given by the average schooling attained of the population 15 years old and above is also taken from the World Development Indicators CD-ROM (2011).

**ESTIMATION OF CURRENCY DEMAND, UNDERGROUND ECONOMY AND TAX EVASION**

**STATIONARITY TESTS**

In line with the objectives of the study, currency-M2 model was first estimated. As with all time series data, the potential existence of unit roots in the variables could lead to spurious estimates (Harvey (1991)). The appropriate way of dealing with such problems was to identify first if each variable has the same order of integration. Thus, our estimation procedure commenced with performing stationarity tests using the Augmented Dickey-Fuller (ADF) and Phillips-Peron (PP) procedures. Table 4 shows the results of the stationarity tests both in levels and first differences. The results indicated
that our measure of education was stationary at levels whiles the remaining variables
became stationary after first difference.

Table 4: Unit Roots Test Results

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>ADF Test</th>
<th>Philips Peron Test</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CV: 1%=-3.6752, 5%=-2.9665, 10%=-2.6220</td>
<td>CV: 1%=-3.6661, 5%=-2.9627, 10%=-2.6200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Level 1st Diff. Level 1st Diff.</td>
<td>Level 1st Diff. Level 1st Diff.</td>
<td></td>
</tr>
<tr>
<td>LNCURM</td>
<td>-1.992 -4.432*</td>
<td>-1.859 -5.256</td>
<td>I(1)</td>
</tr>
<tr>
<td>LNEDU</td>
<td>7.741</td>
<td>-6.237</td>
<td>-</td>
</tr>
<tr>
<td>LNGDP</td>
<td>-2.134 -2.069**</td>
<td>-0.467 -2.531**</td>
<td>I(1)</td>
</tr>
<tr>
<td>LNHGDP</td>
<td>-1.169 -4.322*</td>
<td>-1.039 -6.732</td>
<td>I(1)</td>
</tr>
<tr>
<td>INF</td>
<td>-2.507 -4.058*</td>
<td>-2.433 -4.307*</td>
<td>I(1)</td>
</tr>
<tr>
<td>INT</td>
<td>-0.317 -11.901*</td>
<td>-2.497 -5.261*</td>
<td>I(1)</td>
</tr>
<tr>
<td>LNTGDP</td>
<td>-2.636 -6.589*</td>
<td>-3.132 -6.471*</td>
<td>I(1)</td>
</tr>
</tbody>
</table>

Note: CV=Critical Values
Source: Authors’ estimation

PRESENTATION OF RESULTS FROM THE ERROR-CORRECTION MODEL

In traditional estimates of currency demand, the adjustment of actual currency demand
toward the long run desired currency demand was typically modeled by partial
adjustment mechanism. However, in recent years various error correction models have
been employed to model dynamic adjustment to long run equilibrium. The preferred
specification followed a general to specific strategy and estimated a general dynamic error
correction model (ECM). The ECM embodies both the short- run dynamics and the
long-run equilibrium of the series. It also allows for suitable economic interpretation of
the results, while at the same time it is robust to standard diagnostic testing (Faal 2003).

The results of the econometric estimation of the real currency model are discussed in
Table 5 below. The study sought to search for the most parsimonious model, by
systematically dropping insignificant variables. Thus the results are summaries of the
final version of the currency demand model estimated from 1975 to 2010. It is evident
from the results that the error correcting term is well behaved and significant. According
to the results real currency demand adjusts partially by about 24% in the short run
toward its long run value. The coefficients from the results further indicate that demand
for real currency holdings in Nigeria is mainly determined by taxes, GDP per capita,
interest rate, inflation and previous year’s educational level. The high R-squared of 0.88
demonstrates that these variables to a larger extent explain considerably, variations in real
currency demand in Nigeria. All of these explanatory variables are not only significant
but also carry the expected signs.
The coefficients on the current level of the taxes, GDP per capita and inflation are positive and significant at 5 percent, 1 percent and 1 percent respectively. The intuition which is very much consistent with theory is that at current levels an increase in the tax rate, GDP per capita and inflation in Nigeria have the tendency of raising real currency demand thereby fueling activities in the underground economy. This result is in conformity with the findings by Tanzi (1980, 1983), Hanousek and Palda (2007) and Schneider (1994b). On the other hand increases in the current level of interest rate and ones previous level of education will discourage the demand for real currency. The outcome is deduced from the coefficients on interest rate and one-period lag of education which are negative and significant at 1% and 5% levels respectively. The results are generally consistent with the findings by Cagan (1958), Schneider (2005, 2007) and Schneider and Enste (2000).

Finally, the results indicated that the basic diagnostic tests were all satisfied. The test for functional form (Ramsey RESET) showed no evidence of misspecification at 5 percent significance level. Also the Breusch-Godfrey, Arch test and Durbin-Watson statistics indicate no evidence of serial correlation or heteroskedastic disturbances. Furthermore, the Jarque-Bera test statistic indicated that the errors terms were normally distributed\(^{24}\).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-ratio</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.197</td>
<td>9.506</td>
<td>0.000</td>
</tr>
<tr>
<td>D(LNTGDP)</td>
<td>0.035</td>
<td>2.783</td>
<td>0.011</td>
</tr>
<tr>
<td>D(LNGDPY)</td>
<td>0.475</td>
<td>5.601</td>
<td>0.000</td>
</tr>
<tr>
<td>D(LNINT)</td>
<td>-0.089</td>
<td>-5.356</td>
<td>0.000</td>
</tr>
<tr>
<td>D(LNINF)</td>
<td>0.029</td>
<td>5.628</td>
<td>0.000</td>
</tr>
<tr>
<td>LNEDU(-1)</td>
<td>-0.050</td>
<td>-3.297</td>
<td>0.003</td>
</tr>
<tr>
<td>(RESID)-1</td>
<td>-0.24</td>
<td>-1.927</td>
<td>0.068</td>
</tr>
</tbody>
</table>

**Table 5: ECM Results**

<table>
<thead>
<tr>
<th>Dependent Variable: First Difference of the Natural Logarithm of Real Currency Data Series: 1975-2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D(LNTGDP)</td>
</tr>
<tr>
<td>D(LNGDPY)</td>
</tr>
<tr>
<td>D(LNINT)</td>
</tr>
<tr>
<td>D(LNINF)</td>
</tr>
<tr>
<td>LNEDU(-1)</td>
</tr>
<tr>
<td>(RESID)-1</td>
</tr>
</tbody>
</table>

**Misspecification and Diagnostic Testing**

- Number of observations: 32
- R-Squared: 0.88
- Darbin Watson Stat.: 1.88
- L-M(Arch) test: 0.108
- Breusch-Godfrey test: 6.249
- Jarque-Bera Normality: 0.728
- Ramsey (RESET) Test: 0.566

\(^{24}\) Hendry (1995) provides a useful reference for these tests.
PRESENTATION AND INTERPRETATION OF RESULTS

Using the real currency model as presented in equation (1), we estimated the size of the underground economy as follows: We began by solving the real currency equation for nominal currency holdings in the hands of the public at time (t) given the averaged tax rate. A corresponding series of legal currency holdings was further derived by eliminating the tax variable in equation (1) and therefore creating an incentive for economic agents to participate in the underground economy. In the absence of this variable, the currency holdings by the public would be lower because there is less demand for cash payment of goods and services for the purposes of evading taxes. The difference between these two estimates yields estimates of nominal underground currency holdings in time (t). We then proceeded by finding estimates for illegal money, legal money, velocity, underground economy and tax evasion as outlined in equations (2) to (6) above. Figure 1 below shows the trends in the underground economy and tax evasion as a percentage of GDP. Detailed yearly estimates are tabulated and also presented in Table 6.

The results generally show the presence of a large underground economy and tax evasion in Nigeria. This finding is supported by Schenieder (2007) in his study for developing countries; where the estimated size for the underground economy for Nigeria in 2000, 2001 and 2002 were found to be 57.9, 58.6 and 59.4 percentage points of GDP respectively. According to our results by 1975 the size of the underground economy was 60.3 percent of the GDP but increased to 75 percent the following year. Between 1977 and 1988 the size declined appreciable to 42.5 percent of GDP. However, the average of 57.5 percent for this period was very high. The size of the underground economy took another upward trend from 1989 onward to reach its peak in 1994 recording a size of 79.9 percent of GDP. The average size of 64.08 percent of GDP within this period implied an increase in the size of the underground economy over the previous period. From the 1995 and beyond, the size of underground economy activities showed a downward trend until 2006. From 2006 to 2010 the results indicate an upward trend in the size of the underground economy reaching a peak of 59.02 percents in 2009 but falling marginally to 58.63 percent 2010. The average for the period is 56.36 percent of GDP. The correlation coefficient between the velocity of money and estimates of underground economy is 0.81. This gives an impression that the estimates are highly sensitive to the velocity of money which is assumed to be equal for legal and illegal money. The results generally suggest that the incidence of the underground economy is high and since 2006 it is trending towards historical levels.

Estimates on the size of tax evasion as evident from Figure 1 rather showed significant fluctuations with more of oscillatory trends. The average size of tax evasion for the country over the study period, 1975 -2010 was is 3.9 percent of GDP and is considered among the largest among developing countries (Schneider 2005, 2007). On the whole the years that recorded the largest size of tax evasion included 1978 (53 percent of GDP),
1981 (6.8 percent of GDP), 1990 (6.2 percent of GDP), 1996 (5.3 percent of GDP) and 2001 (6.6 percent of GDP).

The reasons behind the size of the underground economy and tax evasion in Nigeria can be easily ascertained. In the 1960s to early 1970s, tax policy in the country was aimed at maximizing revenue generation to finance public sector programmes in order to meet the accelerated economic growth and development agenda of the government. Attention was therefore directed at increasing the existing tax rates (especially import duties) in the form of high protective tariffs, as a consequence import duties provided the bulk of federal government revenue in the early 1960s (Phillips, 1991).

The underground economy and tax evasion in the country continued to be high in the 1970s as a result of the oil boom. Ariyo (1997) noted that the advent of the oil boom in the 1973/74 fiscal year encouraged over-reliance on oil revenue at the expense of the traditional revenue sources such as tax on export products like cocoa, groundnut and palm kernel. Consequently, some of these non-oil revenue sources were either abandoned or became less important to the government, so that no attention was given to assessing the optimal revenue obtained from these non-oil sources. For instance, before the discovery of oil, revenue from the traditional sources provided adequate revenue for the needs of the public sector and most people outside the tax net used to pay the poll tax. As a result of the oil boom, there arose an over reliance on oil revenue as the main support for public expenditure programming. The contribution of oil revenue to GDP for example rose from 18.9 percent in 1970 to 80.7 percent in 1974, rising further to 82.2 percent in 1989 (Ariyo 1997).

Subsequent introduction of Structural Adjustment Programmes (SAP) in 1986 with the associated tax reform in the 1990s could not reduce the size of the underground economy and tax evasion in Nigeria. This has generally been attributed to the low productivity of the Nigerian tax system; which is further attributed to the deficiencies in the tax administration and collection systems, complex legislation and apathy, especially on the part of those outside the tax net (Ijewere, 1991; Ndekwu, 1991). For instance, there were significant downward adjustments in tax rates and import tariffs as part of the tax reform measures. The corporate income tax (CIT) was reduced from 45 percent in 1986 to 40 percent in order to encourage reinvestment activities by existing organizations and to encourage new investments. Import duties (IMD) on certain categories of goods were also reviewed. Key among these was the elimination of the duties on trucks and commercial vehicles for easy transportation (Ariyo, 1997). The reforms however contributed marginally in reducing the underground economy and tax evasion because in consistent with the “Dutch-disease syndrome” (Corden and Neary, 1982; Herberger 1993), the oil boom encouraged laxity in the management of non-oil revenues especially in CIT and IMD (Ariyo, 1997). The absence of reliable and adequate tax-related information also negatively affected the accuracy and adequacy of the fiscal reforms.
The size of the Nigerian underground economy and tax evasion can further be attributed growing tax rate and the perceived “non-performance” of tax revenue. According to Hirschman’ (1971) if tax payers feel that their interests are served by the government, their willingness to pay taxes grows. If corruption is widespread and the government is not trust worthy, they would not be prepared to pay. The level of taxation, however, is also related to tax morale and income inequality, which enhance the “exit option”, that is the decision to participate in the informal sector. Thus, in Nigeria where tax morale is likely to be low and there is widespread perception of corruption in government coupled with the perceived unequal distribution of income and wealth, the higher will be the incentive to operate in the underground economy and to evade tax.
Table 7: Estimates of the Size of the Underground Economy and Tax Evasion in Nigeria

<table>
<thead>
<tr>
<th>Years</th>
<th>Illegal Money</th>
<th>Legal Money</th>
<th>Velocity</th>
<th>Underground Economy</th>
<th>Tax Evasion</th>
<th>GDP</th>
<th>As Percent. Of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>2466.39</td>
<td>1568.71</td>
<td>5.85</td>
<td>14430.35</td>
<td>782.12</td>
<td>22945.4</td>
<td>62.89</td>
</tr>
<tr>
<td>1976</td>
<td>3724.86</td>
<td>1982.84</td>
<td>5.77</td>
<td>24199.10</td>
<td>1053.46</td>
<td>38632.55</td>
<td>75.14</td>
</tr>
<tr>
<td>1977</td>
<td>5420.95</td>
<td>2254.35</td>
<td>4.47</td>
<td>24228.11</td>
<td>1414.92</td>
<td>33580.00</td>
<td>72.14</td>
</tr>
<tr>
<td>1978</td>
<td>5127.82</td>
<td>2393.18</td>
<td>4.82</td>
<td>24719.97</td>
<td>1930.63</td>
<td>36053.00</td>
<td>68.57</td>
</tr>
<tr>
<td>1979</td>
<td>6124.86</td>
<td>3723.94</td>
<td>4.61</td>
<td>28231.45</td>
<td>1335.35</td>
<td>42912.00</td>
<td>65.79</td>
</tr>
<tr>
<td>1980</td>
<td>9216.22</td>
<td>5173.68</td>
<td>3.89</td>
<td>35819.70</td>
<td>2052.47</td>
<td>50270.00</td>
<td>71.25</td>
</tr>
<tr>
<td>1981</td>
<td>9823.18</td>
<td>5415.72</td>
<td>3.75</td>
<td>36821.46</td>
<td>3428.08</td>
<td>50751.00</td>
<td>72.54</td>
</tr>
<tr>
<td>1982</td>
<td>10064.84</td>
<td>6628.66</td>
<td>3.14</td>
<td>31553.77</td>
<td>2199.3</td>
<td>35793.00</td>
<td>64.17</td>
</tr>
<tr>
<td>1983</td>
<td>11289.59</td>
<td>7744.61</td>
<td>2.95</td>
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Source: Authors' Estimation
CONCLUSION AND RECOMMENDATIONS

The objective of this study was to estimate and analyze the size and consequences of the underground economy in Nigeria using a parsimonious and stable error-correction based currency demand model. Our findings indicate the existence of a large underground economy and tax evasion in Nigeria even in recent times in spite of the comprehensive tax reforms embarked upon in the 1990s. This suggests that the existing national accounts series are not adequate for meaningful economic analysis or for policy formulation. Various reasons have been assigned to this worrying situation. The first is the generally low productivity levels of the Nigerian tax system; which is attributed to the deficiencies in tax administration and collection system, complex legislation and apathy. Second, tax reforms have contributed marginally in reducing the underground economy and tax evasion because in consistent with the “dutch-disease syndrome”, the oil boom encouraged laxity in the management of non-oil revenues especially in corporate income tax and import duties. The advent of the oil boom in the 1973/74 fiscal year also encouraged over-reliance on oil revenue at the expense of the traditional revenue sources such as tax on export products like cocoa, groundnut and palm kernel. Consequently,
some of these non-oil revenue sources were either abandoned or became less important to the government, so that no attention was given to assessing the optimal revenue obtained from these non-oil sources. The third is low tax morale as a result of wide income inequalities and perceived widespread corruption in government. Efforts must therefore be made by the national authorities to establish credible estimates of the key components of the underground economy with the view to incorporating them in the compilation of official statistics. Although the total elimination of the underground economy is impossible, it is imperative that governments consider the implementation of policies to reduce the size further. In this regard long-run market based reforms, including fiscal reforms, along with improved governance and stronger institutions are effective ways of achieving these goals. A comprehensive reform of the current tax system and its administration as well as deregulation and improved provision of government services (such as land titling, domestic security and judiciary services) in all the countries, would likely help in reducing the size of the underground economy.
REFERENCES


