

Non-Tax Factors as Critical Determinants of the Size of Underground Economy in Nigeria: Imperative for Policy Action

¹Ihendinihu, John Uzoma and ²Ochonma, G. Chiemela

¹Accounting/Banking & Finance, Michael Okpara University Of Agriculture, Umudike, Abia State, Nigeria.

²Deputy Director of Finance, Ministry of Finance, Abia State, Nigeria

Corresponding Author: Ihendinihu, John Uzoma

Abstract

The rate at which economic activities are drifting away into the 'shadow' outside the clear view and reach of government agencies in Nigeria is becoming a serious threat to needed government revenue and desired economic growth. This study is carried out with the objective of estimating the size of such shadow activities in Nigeria, and investigating the existence or otherwise of any causal links between tax and non-tax factors and growth in the size of underground economy in Nigeria. A blend of descriptive survey and causal comparative research designs were adopted. Stratified random sampling method was used in selecting two States from each of the six geo-political zones in Nigeria, and from where a total sample of 2,658 was surveyed. Annual data on basic Money Supply components, Gross Domestic Product (GDP), and total Federally Collected Tax Revenue (TAXREV) were collected for the period 1992 to 2006. Our estimation model was derived following the Gutmann's Currency Demand Approach. The Ordinary Least Square Technique was used in analysing the data. The work estimates the size of underground economy in Nigeria at 62.8% of GDP, identifying a weak positive relationship between tax burden and the size of shadow economy. It however implicates high poverty level, illiteracy, unemployment, corruption and low net wage in the official economy as significant factors that drive entrepreneurs into the unofficial economy, and advocates a shift in reform agenda from elaborate fiscal incentives to more practical approaches in implementing people-oriented and anti-corruption reform agenda that are compatible with the Millennium Development Goal.

Keyword: underground economy, tax burden, non-tax factors, tax evasion, unreported income.

INTRODUCTION

Underground economic activity has peculiar appeal to man. This is demonstrated by man's natural desire to earn "off the books" income within his environment. Within this environment is a bustling and shadowing world where jobs, services, and business transactions are conducted by word of mouth and paid for in cash to avoid scrutiny by agents of the state. This "hidden" world is called the 'underground economy'.

The nature of underground activities makes it difficult for its volume to be determined with good measure of precision. Attempts by Scholars (Feige, 1979; Frey and Weck-Heinemann, 1984; Giles, 1997; Schneider, 1997; Schneider and Enste, 2002; Elijah and Uffort, 2007) to determine its size using different methodologies yielded different results, hence the task of estimating the size of underground economy particularly in an underdeveloped economy like Nigeria remains a serious challenge to tax administrators and researchers.

Again, the rate at which economic activities are drifting away into the 'shadow' outside the clear view and reach of government agencies is becoming a serious threat to needed government revenue and desired economic growth. Investigations into the factors responsible for this

growth in different economies tend to produce conflicting results. While some works notably (Schneider and Enste, 2002; Johnson *et al*, 2000; Dabla-Norris and Feltenstein, 2003) isolate tax burden as the critical factor that induce flight of economic activities into the underground economy, other Scholars such as (Sennholz, 2003; Salisu, 2003; Sarte, 2000; Adam and Ginsburgh, 1985) found some non-tax factors to be critical determinants. A more recent inquiry into this in Nigeria by Ihendinihu, (2008) implicated some non-tax factors as having greater potency in influencing the size of underground activities than tax burden. A need to replicate this effort in Nigeria using a different methodology has therefore become necessary. In the light of the above, this work aims at achieving the following objectives:-

- To provide a conceptual review of the nature of underground economic activity and the factors which influence growths in its size in Nigeria.
- To estimate the size of underground economy in Nigeria using the Currency Demand Methodology.
- To examine the relationship between tax burden and the size of underground economy in Nigeria and provide empirical evidence on the effect of the former on the later.

- To determine the effects of non-tax factors on the size of underground activities in Nigeria
- To proffer policy actions to minimize the size of underground economy in Nigeria.

This paper is structured into five sections. The first section gives background information on the work while the second section provides theoretical and conceptual overview of underground activities, and on the determinants of the size of shadow economy. Section three reports the methodological approach adopted in carrying out the investigation while section four presents and discusses the results of our data analysis. Concluding remarks and recommendations are presented in the final section.

LITERATURE REVIEW

Theoretical and Conceptual Framework

The concept of underground economy has elicited a growing interest among scholars, and given rise to divergent theories one of which is the Tax Evasion Expected Utility Theory.

Tax Evasion Expected Utility Theory

Tax evasion expected utility theory is analyzed under the assumption that participants in the underground economy act rationally and are interested in maximizing their expected benefits from their activities, in the same way firms or other types of investors hope to maximize their profits. This, of course, will depend on the extent of the risk they undertake in their investment activities and what the expected return will be.

This theory as posited by Cowell (1990), and Sandmo (1981) is premised on the belief that a rational tax evader would choose that magnitude of understatement of income which would maximize his net expected gain. This theory buttresses the fact that the individual who engages in such illegal activity of operating underground compares the net gains expected from it with what he would get by pursuing a legal activity in the formal economy. He would choose the former only if he perceives that the net expected gain from it is greater than the gain he would receive from a legal activity in the official economy.

Thus, an individual would engage in tax evasion or underground economy only if the expected utility (through non-payment of taxes) exceeds the expected dis-utility. Expected utility from tax evasion equals the amount of taxes evaded multiplied by the probability of not being caught, while the expected cost of evasion equals the penalty for evasion times the joint probability of getting caught, convicted, punished, and thus being made to pay the penalty. Thus an individual's estimates of expected costs and gains

would differ for differing magnitudes of income understated or not reported, and also their attitudes towards risk taking.

It has to be appreciated that expected cost here is given a broad interpretation, as there are costs associated with being suspected or investigated for tax evasion or underground economy even if not convicted. There are also psychic costs in the area of social slur, associated with loss of self-esteem or respect.

These basic assumptions form the theoretical framework on which this work is hinged.

Concept and nature of Underground Activity

Underground economy is a phenomenon that is as old as government and springs from human nature that makes man to be at home with hidden income. The concept is referred to as 'shadow' or 'hidden' economy by Schneider and Enste (2002), and as 'unofficial' and 'invisible' economy by Molefsky (1982). Smith (1980) views underground economic activities as economic transactions of individuals which are designed to escape detection by government, while Tanzi and Shome (1994) define it in terms of unreported income/activity, and as a proxy for tax evasion. Evaluating these views, Ezejelue (2001) noted that there is often a discord in the manner people define underground economy; while some define it as unpaid taxes, others refer to it as the alleged under-estimation of the national accounts. With international perspective in mind, he further outlined manifold forms of underground economic activities.

This paper adopts the meaning encapsulated in the definition advanced by Schneider and Enste (2002:2) viz:

Underground, hidden or shadow economy includes not only illegal activities but also unreported income from the production of legal goods and services, either from monetary or barter transactions that would generally be taxable were they reported to tax authorities.

Within the meaning conveyed in this definition, both legal and illegal activities can go on underground. What essentially makes an activity to be underground appears to be its unreported nature which puts it outside the dragnet of government agencies rather than the legality of the transaction.

Lippert and Walker (1997) equally tried to explain underground economic activity through a structure that classifies the activities into legal and illegal, isolating monetary and non-monetary transactions under each group of activity. Table 1 below summaries their structural classification.

Table 1: A Taxonomy Of Underground Economic Activities.

Type of Activity	Monetary Transactions		Non Monetary Transactions	
Illegal Activities	Trade in stolen goods, drug dealing and manufacturing, prostitution, gambling, smuggling and fraud.		Barter, drugs, stolen goods, smuggling. Producing or growing drugs for own use. Theft for own use.	
	Tax Evasion	Tax Avoidance	Tax Evasion	Tax Avoidance
Legal Activities	Unreported income from self-employment, wages, Salaries and assets from unreported work related to legal services and goods.	Employee discounts, fringe benefits	Barter of legal services and goods	All do it yourself work and neighbour

Source: Lippert and Walker (1997).

This structure provides a basic foundation for the definition given by Schneider and Enste (2002), recognising underground economic activities as comprising of activities of income both legal and illegal which are not reported for tax purposes and which therefore could not be accounted for in the National Income Account.

Estimating the size of underground economy is not an easy task given the hidden nature of activities that take place in the shadow. Perhaps this explains the reason why most empirical studies on shadow economic activities use different variables such as the amount of cash in circulation, or electricity consumption as proxies of the size of underground economy (Schneider and Enste, 2002; Elijah and Uffort, 2007; Ezejelue, 2001; and Richupan, 1984). In their earlier study using the Physical Input (Electricity Demand) Method, Schneider and Enste (1998) indicated the existence of greater underground economic activities in developing African countries than in some Asian and South American countries with African Countries (as represented by Nigeria and Egypt) experiencing the highest size of underground activity ranging from 68% to 76% of the GDP, closely followed by the Asian Country of Thailand with size of underground economy of 70% of the GDP. Their study noted that the least underground activities (13-15% of the GDP) were recorded by the Asian tigers of Singapore and Hong Kong.

It should however be pointed out that this estimation method suffers a major drawback considering that economic activities such as personal services do not require considerable amount of electricity. Moreover, a good number of the citizens in Nigeria is yet to be connected to the national electricity power grid, hence the adoption of Gutmann's Currency Demand Ratio method in this study is considered more appropriate in the Nigerian circumstance.

Determinants of Size of Underground Economic Activities

Literature is replete with explanations on why entrepreneurs get involved in shadow activities.

Increasing tax burden and social security payments have been identified as major driving force behind the size and growth of shadow economy as they add to the cost of production and by extension, to the cost of labour in the official economy. A study by Dabla-Norris and Feltenstein, (2003) found strong evidence that tax regime influences the shadow economy, just as Johnson *et al* (2000) and De-Soto (1989) also identified a combination of high corporate tax burden and other government regulations in the face of ineffective and discretionary application of the tax system as being responsible for people and firms drifting into the informal economy in transition countries. Schneider and Enste (2002) equally identified taxes and social security payments by employers and employees as key factors that predispose entry into the shadow economy.

In their study of the learning curve relationship between aggregate tax rate and the relative size of underground economy in Newzealand, Giles and Caragata (1999) found that about 50 percent of underground activity in Newzealand is a response to changing opportunities and constraints in fiscal policy. This implies that a zero tax rate could eliminate about 50 percent of underground activity, which is suggestive of the fact that the remaining 50 percent of underground economic activities are driven by motives outside tax consideration, hence the need to explore these other non-tax factors.

One of the non-tax factors fingered in literature relates to Unemployment and Rising Restriction in the Official Labour market. There is no doubt that the underground offers ample opportunities for employment. According to Sennholz (2003), unemployment drives youths to live by the motto "any one willing to work can find a job" which as he asserts, is the principle in the underground. Rising restriction in the official labour market in particular, has a major effect on employers' costs and workers' incentives. A study by Schneider and Enste (2002) in many member countries of the Organisation for Economic Cooperation and Development (OECD) reveals that high total labour costs are important causes of high official rates of unemployment, and simultaneously, of expansion in

the underground economy, which employs many people who are officially unemployed.

A heavy regulated economy combined with weak and discretionary administration of the law provides fertile ground for shadow activities. Highlighting on this factor, Johnson et al (2000) indicate the existence of a positive relationship between underground economy and intensity of regulations. Djankov et al (2002) on the other hand identified entry cost in the form of regulations as a major reason why people go underground.

Public doubts about government expenditure decrease tax morale in a society. Any time in the public opinion, there is a feeling that state revenue derived from taxation is ineffectively expensed by government, the public may prefer to pay as less tax as possible. A study by Frey, Weck and Pommerehne (1984) reveals that public doubts will reduce people's trust in government and will subsequently increase their willingness to go underground. Public doubts could trigger off proclivity to bribery and corruption as the mainstay on the unregistered sector of the economy. In a similar study, Salisu (2003) reveals that bribery and corruption as a result of public doubts about government activities especially in Nigeria drive people underground. This corroborates the view of Sarte (2000) who examined the link between the size of the parallel economy and corrupt bureaucracies and concludes that in the presence of a corrupt bureaucracy, it may be efficient to locate economic activities, given low cost of informality, in the subterranean economy.

In a separate study, Elijah and Uffort (2007) unveil a causal relationship between poverty and underground economy especially in developing and transition countries characterised by high unemployment rates. Thus in an attempt to survive economic hardship, the poor embark on a series of legal and illegal activities as a strategy to cope with the situational reality. These legal and illegal activities obviously are operated in the subterranean economy.

Adam and Ginsburgh (1985) implicate inflation as a major determinant of the size of underground economic activity. Their findings based on the study of the implications of shadow economy on official growth in Belgium, corroborates earlier findings by Smith (1983) in his empirical study of US consumers' purchases in the underground sector, concluding that rising prices in the formal economy is among the reasons for increasing underground purchases.

Access to credit was identified by Dabla-Norris and Feltenstein (2003) as one of the determinants of exit into the underground economy. In a study of Pakistan in which they developed a dynamic computable general equilibrium in which optimising agents evade taxes in the hidden economy, they observed that entry and exit

into the underground economy are parts of optimizing behaviour that depend on taxes and access to credit. They further identified marginal rate of return as a critical determinant of the underground economy. This factor could be explained as being derived from the Tax Evasion Expected Utility Theory. Thus, a rational tax evader would choose that magnitude of understatement of income, which would maximise his net expected gains. Based on this theory, Dabla-Norris and Feltenstein (2003) found out that the decision to operate in the underground economy depends on a person's present value of the future stream of returns on marginal investments relative to the return on the capital tax rate. If the marginal rate of return is higher than the tax rate, the person chooses to operate in the official economy. If on the other hand, the marginal rate of return is less than the tax rate, the person will choose to operate underground.

METHODOLOGY

Research Design, Sample and Data Collection

The research design adopted is a blend of descriptive survey and causal comparative designs. The area of study is Nigeria. Stratified random sampling method was used to select twelve (12) States, made up of two (2) states drawn from each of the six geo-political zones in Nigeria. The States are comprised of Abia and Enugu States from the South East Zone, Plateau and Kwara States from the North Central Zone, Sokoto and Kano States from the North West Zone, and finally, Borno and Adamawa States from the North East geopolitical zone. A total sample size of 2,658 was drawn. With the aid of research assistants, a researcher designed questionnaire (duly validated by experts and shown to have a reliability coefficient of .74) was distributed to entrepreneurs operating in these States. With this instrument we obtained their perceptions on the critical factors that affect the size of underground economy in Nigeria. Annual data on basic money supply components, Gross Domestic Product (GDP), Total Federally Collected Tax Revenue (TAXREV), and computed Inflation were also collected for a period of 15 year starting from 1992 to 2006.

Analytical Framework and Model Specification

Currency Demand Ratio is one of the monetary approaches that employ monetary statistics for estimating underground economy. This method as pioneered by Cagan (1958) and further developed by Tanzi (1983) was successfully used by Gutmann (1977) to estimate the size of underground economy in the US. Employing this method, Gutmann made the following four basic assumptions:

1. There is a benchmark (initial) period in which currency-demand deposit ratio is assumed to be relatively stable and underground economy assumed to be non-existent or at least negligible.
2. The underground economy uses currency as the exclusive medium of exchange.

3. The velocity of money is the same as that in the official economy, and
4. The ratio of currency in circulation to demand deposits is constant, if it changes over the years, the change must be due to underground economy.

Our analytical framework follows Gutmann (1977) approach with modifications to reflect current peculiarities in the Nigerian economy. Accordingly, 1990 is adopted as the base year for the study with Currency in circulation to Demand Deposit Ratio of ₦7716/15589 million or 0.495 (CBN, 2007). Our model is derived based on the inter relationship between Underground Money (UM), Legal Money (LM), Velocity of Money in circulation (V), and Size of Underground Economy (SUE). Thus:

$$UM_t = D_t(C_t/D_t - C_b/D_b) = D_t(K_t) \quad (1)$$

Where;

UM_t = Underground Money in year t;

C_t = Currency in circulation in year t;

D_t = Demand Deposit in year t;

C_b = Base year Currency in circulation;

D_b = Base year Demand Deposit; and,

K_t = Difference between Currency in circulation to Demand Deposit in year t and the base year Currency in circulation to base year Demand Deposit.

$$LM_t = (M1_t) - UM_t = (C_t + D_t) - UM_t \quad (2)$$

Where $M1_t$ is Money Supply in year t.

$$V_t = GDP_t/LM_t \quad (3)$$

Where GDP_t = Gross Domestic Product at current basic price in year t.

$$SUE_t = UM_t(V_t) \quad (4)$$

Thus, our model for estimating the Size of Underground Economy (SUE) in Nigeria is given as:

$$SUE = D_t \left[\frac{C_t}{D_t} - \frac{C_b}{D_b} \right] \left[\frac{GDP_t}{(C_t + D_t)} \right]$$

$$D_t(C_t/D_t - C_b/D_b) \dots \dots \dots \{5\}$$

Using this equation, we estimated the Size of Underground Economy in Nigeria for the period 1992 to 2006 and expressed this size as a percentage of GDP (see Appendix 3).

Table 2: Estimated Size of Underground Economy and other Economic Variables.

Year	Estimated SUE ₦' Million (1)	GDP ₦' Million (2)	TAXREV ₦' Million (3)	SUE/GDP % (4)	TAXREV/GDP % (5)
1992	156,237	532,614	72,948	29.33	13.6962
1993	315,000	683,870	84,248	46.15	12.3193
1994	451,376	899,863	80,638	50.16	8.9611
1995	1,133,569	1,933,212	122,861	58.64	6.3553
1996	1,612,006	2,702,719	184,667	59.52	6.8326
1997	1,702,100	2,801,973	191,574	60.75	6.8371
1998	1,691,641	2,708,431	195,900	62.46	7.2330
1999	2,172,968	3,194,024	359,900	68.03	11.2679
2000	3,105,240	4,537,640	769,200	68.43	16.9515
2001	3,241,755	4,685,912	1,016,700	69.18	21.6970
2002	3,834,628	5,403,007	781,800	70.97	14.4697
2003	5,127,323	6,947,820	1,130,200	73.80	16.2670
2004	8,395,432	11,411,067	1,690,300	73.57	14.8128
2005	11,039,598	14,610,881	2,478,000	75.56	16.9600
2006	14,029,299	18,564,595	2,718,200	75.57	14.6418
				$\bar{X} = 62.8$	$\bar{X} = 12.62$

Using the panel data collected, we computed the ratios of SUE/GDP as a proxy for size and TAXREV/GDP as proxy for tax burden (see Appendix 1). We postulate that the Size of Underground Economy (SUE) in Nigeria is a function of Poverty (P1), Illiteracy (P2), High Tax Burden (P3), Unemployment (P4), Corruption (P5), Over bearing Government Restrictions and Control (P6), Low Net Wage in the Official Economy (P7), Inflation (P8), Marginal Rate of Return (9), High Entry Cost in the Official Economy (P10), Illegality of the Goods (P11), and Access to Credit (P12). The linear equations are specified as follows:

$$SUE/GDP = f(TAXREV/GDP) \quad (6)$$

$$SUE = f(a_0 + a_1P_1 + a_2P_2 + a_3P_3 + \dots + a_{12}P_{12}) + e \quad (7)$$

Where $P_1, P_2, \dots, P_{12}$ are the tax and non-tax predictor variables,

a_0 = the constant term, and $a_1, a_2, \dots, a_{12}$ as the coefficients of the independent variables.

e = Error term

SUE = Estimated Size of Underground Economy in Nigeria.

With equation 6, we established the relationship between tax burden and size of underground economy, and the effect of the former on the later. Four functional specifications of equation 7 were also estimated in order to isolate the variables which are critical determinants of SUE in Nigeria. Given the moderate size of the data employed the Ordinary Least Square (OLS) method was adopted using the Statistical Packages for Social Sciences (SPSS) version 10.

DISCUSSION OF EMPIRICAL RESULTS

- 1.
 2. Estimated Size of Underground Economy in Nigeria
- Following the methodology adopted by Gutmann (1977) and reformulated in equation 5 above, we estimate and show the size of underground economy in Nigeria in Table 2 below:

SOURCES: Column (1) – Estimated using equation 5 and data in Appendix 3.

Column (2) – Extracted from CBN (2007).

Column (3) – Extracted from CBN (2007).

Column (3) – National Bureau of Statistics, and Ministry of Employment, Labour, and Productivity, Abuja.

As indicated in Table 2, the estimated size of underground economy in Nigeria increased from 29.33% of GDP in 1992 to 70.97% and 75.57% of the GDP in 2002 and 2006 respectively. Average estimated size of underground economy over the period is 62.8%. In an earlier study, Schneider and Enste (1998) identified Nigeria and Egypt as having the highest size of Underground activities in Africa of 68-76% of GDP, and later estimated the ratio of underground economy to GDP in Nigeria in 2002 at 77% (Schneider and Enste, 2002). Ihendinihu, (2008) adopted a modest estimate of 69%. These results accord with Abiodun and Uffort (2007) who found the average size of the shadow economy in developing and transition countries to be very high when compared with the average of 14-16% in advanced countries. In these countries, the TAXREV/GDP showed irregular fluctuations with 13.7% in 1992 decreasing to 6.36% in 1995 with gradual growth to 21.7% in 2001 and occasional upward and downward swings till 2006 when 14.64% was recorded. The average TAXREV/GDP over the period stood at 12.62% contrasting with 62.8% estimated mean size of underground economy to GDP in Nigeria over the same period.

Tax Burden and the Size of Underground Economy

We investigated the relationship between aggregate tax burden and the size of underground economy in

Nigeria. Our *a priori* expectation is that there is significant positive correlation between aggregate tax burden in the official economy and the size of underground economy, and that high tax burden has significant effect on the size of shadow activities. The result of our test is shown in Appendix 2.

With a correlation coefficient (r) of .372, the result indicates the existence of a weak positive association between heavy tax burden and the size of underground economy in Nigeria. The coefficient of determination (r^2) shows that aggregate tax burden explain about 13.8% of the changes in the size of underground economy with about 86.2% of the variations attributable to other non-tax factors. The F-Ratio of 2.084 is not statistically significant, hence the model specification should be considered as inappropriate. This result is therefore inconsistent with our *a priori* expectation, and highlights the need to search for other factors that induce underground activities in Nigeria.

Tax and Non-Tax Determinants of the Size of Underground Economy in Nigeria

We further investigated eleven (11) non-tax factors in addition to high tax burden to determine which of the factors are critical determinants of the size of underground economy in Nigeria, and the results of our analysis are shown in Table 3 below.

Table 3: Determinants of the Size Of Underground Economy in Nigeria

<i>Variables/Test statistic</i>	<i>Linear</i>	<i>Exponential</i>	<i>Semi-log</i>	<i>Double-log</i>
Constant (t-stat)	1.27 ** (1.746)	.288 * (.979)	2.624 *** (10.711)	.831 *** (8.524)
(P ₁): Poverty	0.108* (1.226)	7.638E-02*** (2.170)	9.631E-02* (.570)	9.058E-02 *** (4.599)
(P ₂): Illiteracy	0.391*** (6.139)	.158 *** (6.215)	.219 *** (5.427)	2.957E-02*** (2.918)
(P ₃): Tax Burden	-.232 *** (- 2.758)	- .115 *** (- 6.427)	.166 *** (4.542)	2.632E-03 ** (3.304)
(P ₄): Unemployment	5.134E-02 * (.691)	7.692E-03 * (.259)	.192 * (3.525)	.202 *** (6.183)
(P ₅): Corruption	6.909E-02 * (.974)	2.999E-02 * (1.058)	-1.99E-03 * (-.035)	.121 *** (4.668)
(P ₆): Govt. Restriction	.189 *** (3.007)	6.471E-02 *** (2.573)	2.799E-02 * (.818)	-9.61E-04 * (.071)
(P ₇): Net wage in official economy	-9.83E-02 * (-1.470)	-4.28E-02 * (-1.600)	-8.69E-02 * (-1.567)	-6.27E-02 *** (-4.305)
(P ₈): Inflation	7.386E-02 * (.872)	1.657E-02 * (.490)	.134 * (.709)	9.901E-04** (5.946)
(P ₉): Marginal Rate of Return	7.940E-02 * (1.195)	4.215E-02 * (1.588)	6.112E-02 * (1.529)	2.600E-02 * (1.529)
(P ₁₀): High Entry Cost	-1.96E-02 * (-.196)	-7.09E-02 * (-.205)	3.370E-02 * (.471)	-5.37E-03 * (-.189)
(P ₁₁): Illegality of the goods	-4.90E-02 * (-.675)	-1.56E-02 * (.537)	2.729E-03* (.096)	3.054E-03 * (.270)
(P ₁₂): Access to credit	4.311E-02* (.494)	2.798E-02 * (.803)	-1.75E-02 * (.435)	-1.45E-03 * (.091)
R	.382 **	.558 *	.436 ***	.821 ***
R ²	.146	.312	.190	.674
F-ratio	4.928 ***	15.810 ***	6.799 ***	72.253 ***

SOURCE: Computed from Survey Data, 2008.

NOTE: *** = Significant at 1%; ** = significant at 5%; and * = Significant at 10% and above. t- values are shown in parenthesis.

In terms of the number of significant variables and the statistical values of the correlation coefficient (r), coefficient of determination, (r^2), and F-Ratio, the double-log form yielded the best fit and is accordingly used in our discussion. The double-log function produced an r of .821 indicating a strong positive relationship between the size of underground economy in Nigeria and the identified predictors ($P_1, P_2, \dots, P_{12}$). With an R^2 of .674, the study evidences that about 32.6% of the changes in the size of hidden economy are attributable to other factors besides the twelve factors used in this study. The appropriateness of the model specification is further highlighted by the F-Ratio of 72.253 which is significant at 1%.

The result implicates five factors – Poverty, illiteracy, unemployment, corruption and low net wage in the official economy - as core determinants of the size of underground economy, all of which proved significant at 1% level. Tax burden and Inflation are shown to be significant only at 5% significant level. This result is coming against the back drop of earlier research findings in advanced economies which associate increases in shadow activities to heavy tax burden. The potency of these five non-tax factors in inducing underground activities in Nigeria is well documented in Ihendinihu (2008) and corroborates the findings by Abiodun and Uffort (2007) that high tax burden is not a strong determinant of the size of underground economy in Nigeria. Thus, factors affecting the size of underground activities are not the same among countries of the world, as the factors which were significant determinants in advanced economies do not necessarily account for high level of underground activities in a developing country like Nigeria, where poverty, illiteracy, unemployment, corruption and low net wage in the official economy constitute serious socio-economic challenges to inhabitants.

The result also indicates five other factors that are not significant determinants of the size of underground economy in Nigeria. These factors are overbearing government restrictions, marginal rate of return, high entry cost, illegality of the goods, and access to credit. Comparative predictive powers of tax and non-tax factors indicate the significant non-tax factors as having greater coefficients than heavy tax burden and this further highlights the enhanced potency of non-tax factors as critical determinants of the hidden economy in Nigeria over heavy tax burden.

CONCLUDING REMARKS

This study has been able to estimate the size of underground economy in Nigeria using Gutmann's Currency Demand Ratio Approach; estimating the average size at 62.8% of the Gross Domestic Product. Empirical evidence is provided on the factors which are critical drivers of shadow activities in Nigeria, identifying a weak positive relationship between

aggregate tax burden and the size of underground activities. The work however implicates high poverty level, illiteracy, unemployment, corruption and low net wage in the official economy as significant determinants of the size of underground activities. The paper advocates a shift in reform agenda from elaborate fiscal incentives and adjustments to more practical approach to the implementation of people-oriented and anti-corruption reform agenda, as evidence in this study proves that a complete elimination of tax burden cannot wipe away shadow activities in Nigeria. The 7-point agenda of the Federal Government should be supported by all levels of government and the private sector operators since the agenda contain issues bordering on employment creation, food security, poverty reduction, enhancing literacy rate, and curbing corruption and improving public accountability and transparency – all of which are geared towards fulfilling the Millennium Development Goal.

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APPENDIX 1: Panel Data Of Total Federally Collected Tax Revenue, Gross Domestic Product, And Estimated Size Of Underground Economy In Nigeria.

Year	Taxr Ev* ₦'000	Gdp* ₦'000	Sue** ₦'000	Sue/Gdp* ₦'000	Taxrev/Gdp* %	%
1992	72948	532614	156237	29.3340	13.6962	
1993	84248	683870	315600	46.1491	12.3193	
1994	80638	899863	451376	50.1605	8.9611	
1995	122861	1933212	1133569	58.6366	6.3553	
1996	184667	2702719	1612006	59.6439	6.8326	
1997	191574	2801973	1702100	60.7465	6.8371	
1998	195900	2708431	1691641	62.4583	7.2330	
1999	359900	3194024	2172968	68.0323	11.2679	
2000	769200	4537640	3105240	68.4329	16.9515	
2001	1016700	4685912	3241755	69.1809	21.6970	
2002	781800	5403007	3834628	70.9721	14.4697	
2003	1130200	6947817	5127323	73.7976	16.2670	
2004	1690300	11411067	8395432	73.5727	14.8128	
2005	2478000	14610882	11039598	75.5574	16.9600	
2006	2718200	18564595	14029299	75.5702	14.6418	

SOURCES: * CBN (2007).

** Extracted from Appendix 2.

Appendix 2: Estimation of the Size of Underground Economy in Nigeria by the Currency Demand Ratio Method
Base Year: 1990; $C_b/D_b = \text{₦}7716/15589 \text{ Million} = 0.495$

Year	Currency in circulation (C _t) ₦ `Million	Demand deposit (D <sub>t</sub>) ₦ `Million	C/D	C _t /D _t less C _b /D _b (K)	Underground Money (UM) ₦ `Million	Legal Money (LM) ₦ `Million	Gross Domestic Product (GDP) ₦ `Million	Velocity of money in circulation (V)	Size of Underground Economy (SUE) ₦ `Million	SUE as % of GDP
1992	39725	42518	0.934	0.439	18664	63579	532614	8.38	156237	29.33
1993	62571	52802	1.185	0.690	36433	78940	683870	6.66	315600	46.15
1994	96185	77257	1.245	0.750	57943	115499	899863	7.79	451376	50.16
1995	133941	97625	1.372	0.877	85617	145949	1,933212	13.24	1,133569	58.64
1996	126040	98224	1.385	0.890	87419	146845	2,702719	18.44	1,612006	59.52
1997	144825	103225	1.403	0.908	93728	154322	2,801973	18.16	1,702100	60.75
1998	172378	120584	1.429	0.934	112625	180337	2,708431	15.02	1,691641	62.46
1999	208561	137937	1.512	1.017	140282	206216	3,194024	15.49	2,172968	68.03
2000	310496	204543	1.518	1.023	209248	305791	4,537640	14.84	3,105240	68.43
2001	403506	263902	1.529	1.034	272875	394533	4,685912	11.88	3,241755	69.18
2002	453153	291230	1.556	1.061	308995	435388	5,403007	12.41	3,834628	70.97
2003	502254	314302	1.598	1.103	346675	469881	6,947820	14.79	5,127323	73.80
2004	645803	404892	1.595	1.100	445831	605314	11,411067	18.85	8,395432	73.57
2005	742388	463418	1.602	1.120	519022	686779	14610881	21.27	11,039598	75.56
2006	774054	479541	1.625	1.130	541881	716914	18564595	25.89	14,029299	75.57

SOURCE: Computed from panel data extracted from Central Bank of Nigeria (2007) Statistical Bulletin, December.

Regression**Model Summary^b**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.372 ^a	.138	.072	12.3964	.331

a. Predictors: (Constant), TAXGDP

b. Dependent Variable: SUEGDP

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	320.311	1	320.311	2.084	.172 ^a
	Residual	1997.729	13	153.671		
	Total	2318.040	14			

a. Predictors: (Constant), TAXGDP

b. Dependent Variable: SUEGDP

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	49.716	9.622		5.167	.000
	TAXGDP	1.038	.719	.372	1.444	.172

a. Dependent Variable: SUEGDP

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	56.3133	72.2383	62.8163	4.7832	15
Residual	-34.5993	10.6553	6.158E-15	11.9455	15
Std. Predicted Value	-1.360	1.970	.000	1.000	15
Std. Residual	-2.791	.860	.000	.964	15

a. Dependent Variable: SUEGDP