

THE RELATIONSHIPS BETWEEN CORRUPTION, POVERTY, AND THE RISING UNDERGROUND ECONOMIC ACTIVITIES IN DEVELOPING ECONOMIES- A COMPARATIVE ANALYSIS OF NIGERIA

Dr. Sam Eniola Agbi, PhD, CPA, CMA, ACMA, CSC, ACTI
Department of Accounting, Faculty of AMSS, Federal University,
P.M.B, 5001, Dutsin-Ma, Katsina State, Nigeria.

ABSTRACT: *An explanation and exploration is given concerning issues pointedly concerned with the impacts of: underground economy on corruption; and the relationship with poverty level in developing economies. This relationship was the particular linkage such that quite often shadow economy and corruption are seen by researchers as twins, who need each other or fight against each other. Most countries of the world, including the United Kingdom, the United States, Canada, Netherlands, and Nigeria in particular, a large amount of government revenue are derived from taxes. This revenue inevitably shrinks through underground economy and corrupt practices. Therefore, shadow economy has been adjudged the most formidable attendant human practice that reduces the revenues owed to the government, consequently, shadow economy induced poverty in developing economies. Since 1990, problems of shadow economy have become a major concern for governments and policy makers, which therefore, caused increased attention among researchers, economic communities, and social scientists.*

KEYWORDS: Corruption and Poverty in Nigeria, Rising Underground Economy, Sam Agbi, Underground Economic Activities, Developing Economies, and Eniola Agbi

INTRODUCTION

A cursory review of the required literature demonstrated that poverty in developing countries was influenced by a number of factors such as: underground economy and corruption. For countries all over the world, there are several important reasons for concern about the size and growth of the shadow economy (Dreher & Schneider, 2006). Chief among them is that, an increase in the size of the underground economy is mainly caused by a rise in the overall burden of tax and social security payments by taxpayers (Schneider, 2006; Torgler & Schneider, 2007). The increase in shadow economic activities, corruption, and poverty level will subsequently, lead; to erosion of the tax and social security bases, and lastly; to decrease in tax receipts for governments (Elijah & Uffort, 2007; Schneider, 2000; 2005). The consequence would be a further increase in the budget deficit or further rise of direct and/or indirect tax rates. Shadow economic activities would then increase (Schneider, 2007).

Other reason for concern about the presence of shadow economy is that when the shadow economy grows, economic policy is based on erroneous official indicators, such as unemployment, official

labor force, income, and consumption (Rockwool Foundation, 2008). In such a situation a prospering shadow economy may cause the government severe difficulties, because it provides unreliable official indicators. The very direction of intended policy measures may therefore be questionable. Additionally, a rising underground economy can be seen as a reaction by individuals who feel overburdened by state activities, such as high taxes and an increasing number of regulations (Schneider, 2005).

Furthermore, a growing underground economy may offer strong incentives to attract workers, both domestic and foreign. These workers would then contribute less within the official economy (Dreher & Schneider, 2006; Schneider, 2000). These growing concerns have led many economists to the challenging and difficult task of measuring the size and development of the shadow economy, to trace back its main causes, and to analyze the interactions of the official and unofficial economies (Feige & Urban, 2008; Schneider & Burger, 2005).

THEORETICAL FRAMEWORK

Corruption and the Shadow Economy

Quite often shadow economy and corruption are seen by researchers as twins, who need each other or fight against each other (Dreher & Schneider, 2006). This means for a social scientist that, theoretically, corruption and the shadow economy can be either complements or substitutes (Schneider, 2006; 2007). Corruption and the existence of shadow economies are known but difficult to measure (Buehn & Schneider, 2009). Therefore, what little evidence is available comes from surveys of leading international organizations, such as the World Bank. Many of such researchers analyze corruption and the shadow economy independently of each other. Less research is done explicitly addressing the relationship between corruption and the shadow economy using empirical & methods (Dreher Schneider, 2009). From a theoretical standpoint corruption can either substitute or complement the shadow economy, but the precise nature of the relationship is not clear. The work of Buehn and Schneider (2009) analyzes the link between corruption and the shadow economy empirically using a structural equation model (SEM). By modeling the two concepts as latent variables, Buehn & Schneider contributed to the debate on whether the shadow economy increases or decreases corruption and how corruption affects the shadow economy.

In their influential paper, Shleifer and Vishny (1993) consider two corruption scenarios: corruption in a centralized bureaucracy and corruption in a decentralized bureaucracy. Shleifer and Vishny found that a centralized bureaucracy reduces corruption because bureaucrats in a centralized bureaucracy take the negative impact of their actions on other bureaucrats into account when maximizing the amount of bribes. A decentralized economy, on the other hand, increases corruption because bureaucrats do not take this externality into consideration (Buehn & Schneider, 2009; Schneider, 2006; 2007). Other research works explore the link between corruption in the official economy and the size of the shadow economy. Johnson, Kaufmann, and Shleifer (1997), and Kaufmann et al. (2007) presented comparable full employment models in which individuals are employed either in the official or in the shadow economy. In Johnson et al. (1997) model, the

shadow economy is a substitute for the official economy and exhibits a negative relationship, that is, an increase in the shadow economy results in a decrease in the official economy. According to Johnson et al. (1997) studies, higher corruption in the official economy increases the size of the shadow economy, which functions like a tax on firms in the official economy and drives them underground. In a model in which taxpayers collude with tax inspector, Hindriks, Muthoo, and Keen (1999), and Kaufmann et al. (2007) also found a positive (complementary) relationship between corruption and the shadow economic activities.

Choi and Thum (2005) presented a model in which the entrepreneur's option to go underground constrains the corrupt bureaucrat's ability to ask for bribes. Choi and Thum found that, shadow economy mitigates distortions in the official economy and disables bureaucrats from realizing personal gains. According to Choi and Thum, the existence of the shadow economy thus reduces corruption, for example, bribes. Dreher et al. (2005; 2007) extended Choi and Thum model by specifying institutional quality, whereby higher institutional quality reduces the shadow economy. Dreher et al. (2007) found that the effect of institutional quality on corruption was ambiguous and depends on the effectiveness of anticorruption measures of the governments. Dreher et al. also found that corruption and the shadow economy are substitutes as the shadow economy imposes constraints on bureaucrats: when firms have the option of going underground, bureaucrats reduce the equilibrium level of bribes. Thus, similar to the findings of Choi and Thum (2005), corruption is lower in the presence of a shadow economy.

In their work, Echazu and Bose (2008) widen the analysis of Shleifer and Vishny (1993) and considered corrupt bureaucrats in the official and shadow economies. Echazu and Bose argued that, while horizontal centralization in which two different bureaucrats participate in both the official and the shadow economy lowers corruption, vertical centralization in which one bureaucrat is charged with monitoring activities in the official and shadow economies increases corruption. Echazu and Bose's more in-depth analysis of the relationship between corruption and shadow economy confirmed the findings of Shleifer and Vishny (1993) but contradicts the findings of Choi and Thum (2005). According to Echazu and Bose, centralization across the two sectors may increase corruption and reduce the size of the official economy. Thus, the official economy does not complement the shadow economy as it does in Choi and Thum's studies.

Since the relationship between corruption and the shadow economy is ambiguous from a theoretical point of view, empirical investigations can make an interesting contribution to the literature. While Dreher et al. (2007) focus on the impact of institutional quality; Dreher and Schneider (2006) analyze corruption and the shadow economy using panel data. Dreher and Schneider found mixed evidence depending on the indicators chosen and the specification employed. In the process of finding an acceptable model that correlate that relationship between corruption and shadow economy, Buehn and Schneider (2009) model corruption and the shadow economy as unobservable variables using a structural equation model with two latent variables and several causes and indicators. This approach of Buehn and Schneider has two main advantages over other models in the existing literature.

First, Buehn and Schneider extracted information from different dimensions of the shadow economy and corruption, enabling better estimation of the unobservable, multidimensional variables. Second, the structural equation model of Buehn and Schneider reveals the link between the two unobservable variables. It is worthy to mention that, Buehn and Schneider are the first to analyze directly whether corruption and shadow economy exhibit a negative relationship as shown in Choi and Thum (2005) or a positive relationship as shown in Johnson et al. (1997) or Echazu and Bose (2008) using a structural equation model.

A Structural Equation Model for Corruption and the Shadow Economy

While international organizations like the World Bank require developing countries to fight corruption, anti-corruption measures may be ineffective if the reciprocal relationship between corruption and the shadow economy is not addressed (Schneider, 2006). Plausible policy recommendations must take this link into account. A structural equation model (SEM) by Buehn and Schneider (2009) can provide useful information about the relationship between corruption and the shadow economy. Buehn and Schneider's SEM models corruption and the shadow economy as two distinct latent variables and explored their relationship using the covariance structures between these latent variables observable causes and indicators.

Formally, the Buehn and Schneider's (2009) SEM consists of two parts: the structural equation model and the measurement model. The structural equation model is represented by:

$$\boldsymbol{\eta} = \mathbf{B}\boldsymbol{\eta} + \boldsymbol{\Gamma}\mathbf{x} + \boldsymbol{\zeta}, \quad (1)$$

Where each x_i , $i = 1, \dots, q$ in vector $\mathbf{x}' = (x_1, x_2, \dots, x_q)$ is a potential cause of one of the two latent variables contained in vector $\boldsymbol{\eta}$. The individual coefficients $\boldsymbol{\gamma}' = (\gamma_1, \gamma_2, \dots, \gamma_q)$ in matrix $\boldsymbol{\Gamma}$ describe the relationships between the latent variables and their causes. According to Buehn and Schneider (2009), each latent variable is determined by a set of exogenous causes. The error terms in vector $\boldsymbol{\zeta}$ represent the unexplained components, the covariance matrix for which is abbreviated by $\boldsymbol{\Psi}$. $\boldsymbol{\Phi}$ is the $(q \times q)$ covariance matrix of the causes. The coefficient matrix \mathbf{B} shows the influence of the two latent variables on each other, that is, the influence of the shadow economy on corruption and vice versa.

The Buehn and Schneider's measurement model links the latent variable to its multiple observable indicators, that is, the model assumed that the latent variable determines its indicators. The measurement model provides information that single-indicator models do not. The model is specified by:

$$\mathbf{y} = \boldsymbol{\Lambda}\boldsymbol{\eta} + \boldsymbol{\varepsilon}, \quad (2) \text{ where}$$

$\mathbf{y}' = (y_1, y_2, \dots, y_p)$ is the vector of indicators for corruption and the shadow economy, $\boldsymbol{\Lambda}$ is a matrix of regression coefficients, and $\boldsymbol{\varepsilon}$ is a $(p \times 1)$ vector of white noise disturbances, the $(p \times p)$ covariance matrix for which is given by $\boldsymbol{\Theta}\boldsymbol{\varepsilon}$.

The model's parameters are estimated using the information contained in the observed variables variance and covariance matrices. Thus, the goal of the Buehn and Schneider's (2009) estimation procedure is to find values for the parameters and co-variances that produce an estimate for the

SEM model's covariance matrix $\Sigma(\theta)$, $\Sigma^* = \Sigma(\theta^*)$ that most closely corresponds to the sample covariance matrix of the observed causes and indicators. The Buehn and Schneider (2009) model has the following matrix notation: as equation (3) and (4) below respectively.

$$\begin{bmatrix} \eta_1 \\ \eta_2 \end{bmatrix} = \begin{bmatrix} 0 & \beta_{12} \\ \beta_{21} & 0 \end{bmatrix} \cdot \begin{bmatrix} \eta_1 \\ \eta_2 \end{bmatrix} + \begin{bmatrix} \gamma_1 & \gamma_2 & \gamma_3 & 0 & 0 & \dots & 0 \\ 0 & 0 & 0 & \gamma_4 & \gamma_5 & \dots & \gamma_q \end{bmatrix} \cdot \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ x_5 \\ \vdots \\ x_q \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \end{bmatrix},$$

Figure 1: Matrix Notation Equation (3)

$$\begin{bmatrix} y_1 \\ y_2 \\ y_3 \\ y_4 \\ y_5 \\ \vdots \\ y_p \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ \lambda_2 & 0 \\ \lambda_3 & 0 \\ 0 & 1 \\ 0 & \lambda_5 \\ \vdots & \vdots \\ 0 & \lambda_p \end{bmatrix} \cdot \begin{bmatrix} \eta_1 \\ \eta_2 \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \\ \varepsilon_5 \\ \vdots \\ \varepsilon_p \end{bmatrix},$$

Figure 2: Matrix Notation Equation (4)

From the above, η_1 and η_2 are the latent variables for the shadow economy and corruption respectively, equations (3) and (4) represent the structural and measurement models, respectively (Dreher, Kotsogiannis, & McCorrison, 2008). The estimation of the parameters β_{12} and β_{21} in the Buehn and Schneider's SEM model explain the relationship between the two latent variables η_1 and η_2 , that is, between the shadow economy and corruption. β_{12} describes the effect of η_1 (the shadow economy) on η_2 (corruption) while β_{21} describes the effect of η_2 (corruption) on η_1 (the shadow economy). Having tested the hypotheses about the theoretical relationships between the latent variables and their causes and indicators, Buehn and Schneider (2009) found that, the

relationship between corruption and the shadow economy can be analyzed. Figure 3 below displays the SEM model used by Dreher and Schneider (2009) to analyze the relationship between the shadow economy and corruption.

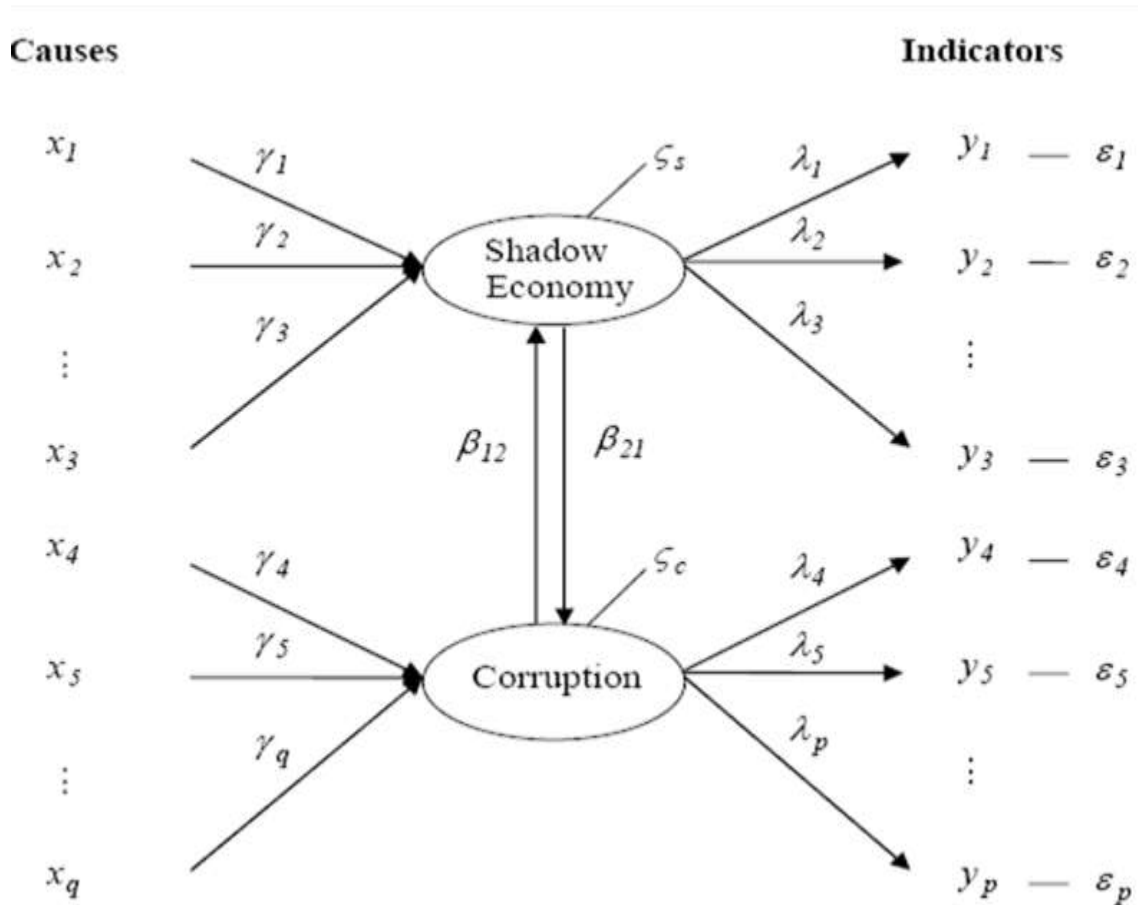


Figure 3: Structural Equation Model (SEM)

Additionally, Buehn and Schneider (2009) explored the political, social, and economic causes of corruption. In their standard specification (*Benchmark Model*), the rule of law and government effectiveness was used to capture the political causes of corruption. Buehn and Schneider found that greater respect for the rule of law and better institutional quality would reduce corruption. A measure for bureaucracy costs was also used to capture the economic causes of corruption. For this index, higher scores indicated stricter rules of law and, consequently, higher bureaucratic costs (Buehn & Schneider, 2009). Buehn and Schneider found that higher bureaucratic costs increase corruption. Figure A (See, Appendix A) shows the Benchmark Model's path diagram whereby the small squares attached to the arrows indicated the expected sign in the empirical analysis.

Poverty and Underground Economy

Poverty and underground economy are serious problems with corrosive effects facing many countries (Fisman & Svensson, 2007). Poverty is currently one of the most serious problems in the World. Estimates indicated that about 1.5 billion people live below the poverty line of less than one dollar per day in the whole world. Out of the 1.5 billion people, Africa contributes about 250 million, which is about 17% of the world's total poor population (Elijah & Uffort, 2007; Pickhardt & Shinnick, 2009). According to the World Bank report (World Bank, 2010), over 70% of Nigeria 170 million people are leaving below poverty level. Poverty is multidimensional phenomenon with physical, economic, social, and psychological dimensions (Whelan & Whelan, 1995; World Bank, 2002; Narayan et al., 2000). Based on its multidimensional scenery, poverty is usually perceived using different criteria (Elijah & Uffort, 2007; Gerring, Bond, Barnst, & Moreno, 2005). This accounts for the copious attempts in defining poverty; each definition tries to capture the perception of the author or the poor as to what the term is.

As poverty increases in Nigeria and countries of the world, there also appears a strong indication about the increasing rates of shadow economy around the world (Elijah & Uffort, 2007; Schneider, 2005). Although quite a large amount of literature has been published on single aspects of the shadow economy or underground economy, and a comprehensive survey has been written by Schneider and Enste (1989; 1999; 2002), the subject is still quite controversial with some disagreements about the use of shadow economy estimates in economic analysis and policy aspects as well as causes of shadow economy with regards to poverty (Colin, 2009; Elijah & Uffort, 2007; Obayelu & Uffort, 2007). Poverty has been perceived by many as not just lack of money, food and assets but also as lack of access to education and health care and lack of security, dignity and independence (Elijah & Uffort, 2007; Narayan & Petesch, 2002; Portes & Haller, 2005). (Please, see appendix B for taxonomy of types of shadow economic activities).

Relationship between underground economy and poverty

On the relationship between shadow economy and poverty, Obayelu and Uffort (2007) studies indicated there is a causal relationship between shadow economy and poverty in developing countries. Obayelu and Uffort studies found that, lack of job within the formal economy, high rate of corruption, economic hardship, and lack of enough money for a living as the common causes of both poverty and shadow economy in developing countries and in Nigeria in particular. In view of the reviews and findings from other works on shadow economy and poverty, there is a causal link between shadow economy and poverty especially in the developing and transition countries (Elijah & Uffort, 2007; Obayelu & Uffort, 2007; Schneider, 2006). While high tax burden, excessive government regulation of economic activities, high social security system, and bureaucracy are some of factors leading to high shadow economy in the highly developed countries, high unemployment rates, corruption that causes poverty are some of the factors accounting for large shadow economies in the developing, and transition countries (Elijah & Uffort, 2007; Kirchler, 2007). According to Elijah and Uffort (2007), the developing countries

have the highest and increasing rate of shadow economy and poverty level when compare to the transitional and OECD countries. Figure C and D (Appendices C and D); present the shadow economy measurement country-by-country in figures and a world map view. Countries shown with darker colors in Figure indicate higher levels of informality and higher percentage of poverty to the country's population. Chief among them: Nigeria, Azerbaijan, Bolivia, Georgia, Peru, Panama, Tanzania, and Zimbabwe. Countries shown with lighter colors indicate countries with lower levels of shadow economy and lower poverty rate to the country's population. Among them: Austria, Japan, Luxembourg, Switzerland, the United States, and the United Kingdom.

The size of shadow economies for developing African countries. The results for the size of the shadow economies for developing countries by Schneider and Schneider et al. are divided by continent into Africa, Asia, and Central and South America (Schneider, 2007; Schneider et al., 2010). Considering the development of the shadow economies in 37 African countries from 1999/2000 to 2007/2008, Schneider et al. (2010) found that shadow economies in African nations have increased. These African countries; were noted to have experienced increases in the level of poverty during the same period. On average, the size of 37 countries' shadow economies was 41.3% (of official GDP) in 1999-2000, and increased to over 48% in 2007/2008 but highest average value with 49.2% occurred in the years 2002/03 and 2003/04, from 2003/2004 there were slight decrease to 42.8% in 2004/05 in the size of the shadow economy and then increased to 48.5% in 2007/2008 (Buehn & Schneider, 2009; Schneider, 2007; Schneider et al., 2010). Turning to the country average for the size of the shadow economy from the 1999/2000 to 2007/2008 period, Tanzania, Nigeria, and Zimbabwe (with 60.2, 59.7, and 57.0% respectively) have by far the largest shadow economies, and the country in the median position is Madagascar with 38.5% of shadow economy to the official GDP. South Africa has the lowest shadow economy, with 29.5%, followed by Lesotho with 32.1%, and Namibia with 32.6% (Schneider, 2007; Schneider et al., 2010). The large shadow economy in Africa (and in other developing countries) is only to some extent an issue of tax burdens, corrupt practices, and regulation, given the simple fact that the limited local economy means that citizens are often unable to earn a living wage in a legitimate manner (Obayelu, & Uffort, 2007; Pickhardt & Shinnick, 2009; Richardson, 2006). Therefore, working in the shadow economy is often the only way of achieving a minimal standard of living (Obayelu & Ogunlade, 2006; Schneider, 2006; 2007; Schneider et al., 2010). Table C (see Appendix C) shows the size of shadow economies for developing African countries for period 1999/2000 to 2007/2008 with the country average measure for the nine years. To this end, the link between underground economy and poverty has been conclusively established and was demonstrated to be particularly tied to the corrupt practices in those economies.

CONCLUSION AND RECOMMENDATIONS

Estimates of the size of the Nigeria shadow economy contained in many studies over the last 17 years have ranged from 43% to over 62% of gross domestic product (GDP). One prominent finding from studies on the size of shadow economy is that, from 1999 to 2007, shadow economies appear to be on the rise in Nigeria (Schneider; 2009, 2010). For example, Nigeria's shadow

economy in 2004 was 59.5 percent of the GDP, and 62.1 percent in 2006. This climbed to 62.9 percent of GDP in 2007. See Table C (Appendix C). Nigeria's official GDP, according to the World Bank (2013) was \$262.61 billion US Dollar for 2012, representing only about 37.1 percent of Nigeria's GDP, but if the shadow economy (62.9%) were added, it could potentially be as much as **\$707.84 billion** or more. This figure translated into a loss of income and commodity tax revenues of about **\$445.23 billion U.S Dollars (about N4.76 trillion naira)**, for 2012 alone. Therefore, the shadow economy is a problem that required urgent attention to solve since the size of the tax loss is significant to the Nigerian economy. Consequently, the problem of shadow economy requires continuous attention and continuous efforts from FIRS and all Nigerian which includes, the recommendations detailed below.

The Nigeria Federal Inland Revenue Service (FIRS) should assess the role that social marketing might play in making the public aware of the societal costs of unpaid taxes and in soliciting its support to combat the underground economy. The department should also strengthen the activities that promote voluntary compliance by businesses. The revenue agency should consult with private sector organizations and associations and promote voluntary compliance through visits to businesses. In addition, FIRS should be dynamic in pursuing definite legislative changes such as the introduction of a new compulsory requirement for reporting income in the construction business (where shadow economy is high), and a new reporting structure for all federal government services contracts.

Nigeria Government should announced a new plan to combat the shadow economy by allocating staff to the non-filers and non-registrants program and more staff to the audit of small businesses, where most of the shadow economy activity exists. A reasonable percent of the department's audit staff should be allocated for small and medium-sized businesses to be strictly involved in the shadow economy scheme audit activities. These staff should be trained to audit small business taxpayers who have inadequate tax records.

FIRS should sign memoranda of understanding with all state governments to increase co-operation to combat the shadow economy more effectively. FIRS should also sign memoranda of understanding with all ministries and departmental Services (MDS), states, and local governments to promote the exchange of information on employment Insurance payments and income reported for tax purposes. Additionally, other schemes that include voluntary compliance in small businesses such as community visits and consultations with industry associations should be promoted. As well, this should involve other federal departments, state, local governments, and private sector organizations in sharing information to improved agreement with the shadow economy plan. In addition, FIRS should improve targeting of audits for the detection and re-examination of unreported income. As well, legislative opportunities should be initiated to strengthen existing incentives to deter participation in the shadow economy.

FIRS should promote legislation that mandate reporting of all cash transactions. Several countries now have legislation requiring the reporting of cash transactions over a certain amount. Although, Nigeria legislation currently does not requires recording of these transactions by banks, in addition,

there should be a centralized reporting mandate to an agency to follow up on suspicious banking transactions in Nigeria. Creation of such reporting agency will be helpful in combating shadow economic activities and in tracking cash sales and all swap transactions which may result in unreported income for tax purposes.

To effectively combat underground economic activities and corrupt practices in Nigeria which in turn; reduce the poverty level, Nigerian revenue agency should work co-operatively with states, other government departments and key interest groups, encourage voluntary compliance, enhance legislative effectiveness and audit techniques, publicize underground economy and tax evasion convictions, strengthen programs to identify non-filers and non-registrants, compliance research, and finally, focus on high non-compliance sectors.

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Appendices

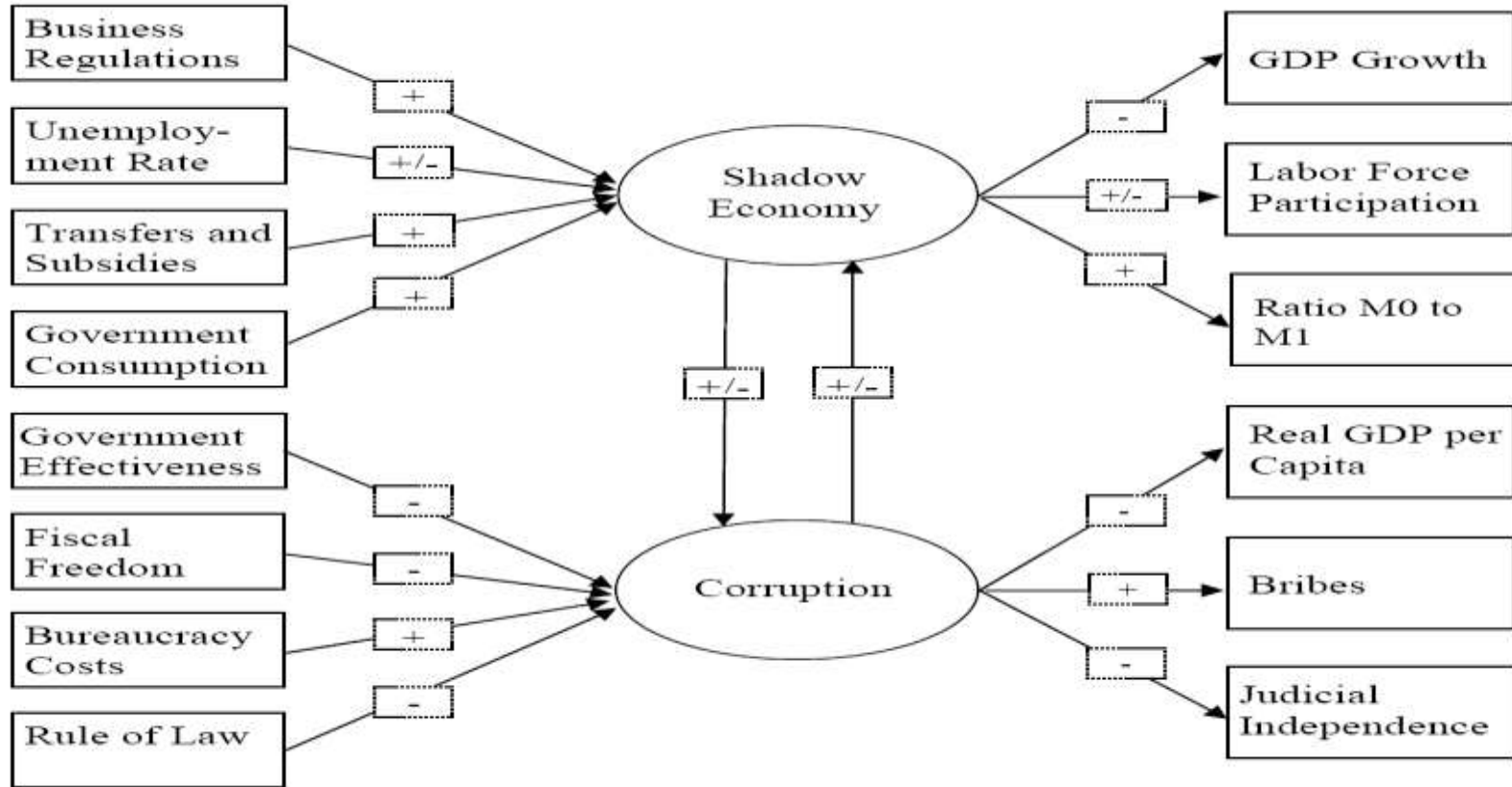


Figure A: Path Diagram of the Benchmark Model of Shadow Economy and Corruption.

Appendix B

Type of activity	Monetary transactions	Non-monetary transactions		
Illegal activities	Trade in stolen goods, drug dealing and manufacturing, prostitution, gambling, fraud, etc.	Barter of drugs, stolen goods, smuggling, etc., production or growing of 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 official/lawful goods and services.	Employee discounts fringe benefits.	Barter of official/lawful goods and services.	All do-it-yourself work and neighborly help.

Structure of the table is taken from Lippert and Walker (1997)

Table B: Taxonomy of Types of Shadow Economic Activities

Appendix C**The Size of Shadow Economies**

		Shadow Economy (in % of official GDP) using the DYMIMIC and Currency Demand Method									Country
No.	Country	1999/00	2000/01	2001/02	02/03	2003/04	2004/05	2005/06	2006/07	2007/08	Average
1	Algeria	34.0	34.1	34.4	34.9	35.8	36.6	37.3	37.3	37.1	35.7
2	Angola	41.6	41.6	41.9	42.8	43.0	43.1	45.0	45.9	37.1	35.7
3	Benin	48.5	49.4	49.8	50.0	50.2	50.1	49.8	50.0	50.4	49.8
4	Botswana	33.0	33.4	33.6	33.5	33.8	34.0	34.1	34.5	34.8	33.9

5	Burkina Faso	41.5	441.4	41.5	41.4	42.4	42.7	43.0	43.0	43.1	42.2
6	Burundi	40.4	40.0	39.8	40.0	39.8	39.8	39.7	39.8	39.8	39.9
7	Cameroon	32.3	32.8	33.2	33.4	33.9	34.0	33.9	34.2	34.2	33.5
8	Central African Republic	51.5	51.7	51.2	50.1	46.9	46.5	46.9	48.1	48.9	49.1
9	Chad	46.1	46.2	46.9	47.4	48.4	51.2	51.6	51.0	50.5	49.1
10	Congo, Dem. Rep.	48.8	48.0	47.8	47.9	49.0	49.2	49.3	49.3	49.4	48.7
11	Republic of Congo	46.8	48.2	49.2	49.7	49.7	50.3	51.9	53.3	52.0	50.1
12	Cote d'Ivoire	44.9	43.2	42.1	41.0	40.5	40.4	40.2	39.7	39.6	41.3
13	Egypt, Arabian Republic	34.7	35.1	35.0	34.5	34.8	35.2	35.4	35.4	36.1	35.5
14	Ethiopia	39.9	40.3	41.2	41.0	40.5	42.0	43.1	44.5	45.7	42.0
15	Ghana	41.8	41.9	42.0	42.2	42.5	42.9	44.3	45.3	45.6	43.2
16	Guinea	39.5	39.6	39.9	40.4	40.4	40.6	40.8	40.3	40.0	40.2
17	Kenya	35.0	34.3	34.7	33.8	33.9	34.9	36.0	37.7	39.4	35.5
18	Lesotho	30.9	31.3	31.5	31.6	31.9	32.5	32.4	33.3	33.8	32.1
19	Madagascar	39.1	39.6	40.4	34.7	36.0	37.7	38.5	39.5	40.5	38.5
20	Malawi	40.7	40.3	38.3	36.5	37.5	38.3	38.2	39.4	41.1	38.9
21	Mali	42.1	42.3	43.8	44.4	44.7	44.0	44.5	44.7	44.7	43.9
22	Mauritania	36.7	36.1	36.2	36.4	36.4	37.2	37.9	40.8	-	37.2
23	Morocco	36.3	36.4	37.1	37.3	37.8	38.7	37.9	39.8	39.8	37.9
24	Mozambique	39.5	40.3	40.2	40.8	40.8	40.9	41.6	42.0	-	40.8
25	Namibia	31.4	31.4	31.6	31.5	32.2	33.1	33.3	34.1	34.4	32.6
26	Niger	42.1	41.9	43.0	43.7	44.4	43.2	44.4	45.6	-	43.5
27	Nigeria	57.8	57.9	58.0	58.2	59.5	60.8	62.1	62.9	-	59.7
28	Rwanda	40.1	40.3	40.0	40.7	39.9	40.4	41.4	41.5	-	40.5
29	Senegal	45.2	45.1	45.6	45.1	45.8	46.9	47.8	47.8	48.4	46.4
30	Sierra Leone	40.3	40.2	41.2	43.3	43.8	44.2	44.3	45.0	45.6	43.1

31	South Africa	28.4	28.4	28.4	28.8	29.0	29.7	30.4	30.9	31.7	29.5
32	Tanzania	58.0	58.3	58.9	59.7	60.1	60.6	61.3	61.9	63.0	60.2
33	Togo	35.8	35.1	34.8	35.7	35.3	35.2	35.2	35.6	-	35.3
34	Tunisia	38.1	38.4	38.9	39.0	39.4	39.9	40.0	40.9	41.4	39.6
35	Uganda	42.7	43.1	43.3	43.3	43.7	43.8	44.0	45.1	45.8	43.9
36	Zambia	48.5	48.9	59.5	49.7	50.4	51.2	51.7	53.1	54.3	50.8
37	Zimbabwe	59.2	59.5	57.4	56.1	55.2	56.6	56.8	56.6	56.1	57.0

Adapted from Schneider, Buehn, & Montenegro (2010)

Table C: The Size of the Shadow Economy in 37 African Countries

Appendix D

World Map View of Shadow Economy

New technology also allows us to present the informality measurement country-by-country in a world map view. Countries shown with darker colors in Figure indicate higher levels of informality. Among them: Azerbaijan, Bolivia, Georgia, Peru, Panama, Tanzania, Nigeria, and Zimbabwe. Countries shown with lighter colors indicate countries with lower levels of informality. Among them: Austria, Japan, Luxembourg, Switzerland, the United States, and the United Kingdom. (See, figure E below)

