CHAPTER ONE

INTRODUCTION

1.1 Preamble

The Shadow Economy (SE) includes economic activities carried out by individuals and firms that do not conform to some or all the required government regulations. Some required regulations on economic activities include compliance with tax payments, registration of firms, pension contributions, and labour market regulations. However, most firms do not comply with these regulations. Non-compliance with regulations implies that individuals and firms in the SE cannot access benefits that accrue from being in the formal sector.

Today, a significant percentage of economic activities, which are dominated by microenterprises, and employment in the labour market of Nigeria, belongs to the shadow economy. Specific characteristics of the Nigerian socio-economy, including high rates of population growth, urbanisation, unemployment, and weak social security nets, make the SE a sector of choice. The decision to take part in SE activities has implications for the growth of the economy and therefore forms the basis of this study.

1.2 Problem statement

The concept of the SE was coined in the early 1970s while investigating the urban sector of Kenya and Ghana (ILO, 1972; Hart, 1973). The argument was that lack of development gave rise to the incidence of SE. The dualist thought, which prevailed before the 1970s viewed the sector as a traditional economy operating side by side with the formal economy (Lewis, 1954; Todaro, 1970). The expectation was that the SE would shrink in size as the formal economy grows. However, it has continued to evolve and thrive in both developing and advanced countries, thereby stimulating international interest (Medina and Schneider, 2018). According to Medina and Schneider (2018), SE accounts for about 35 per cent of the Gross Domestic Product (GDP) and 70 per cent of the labour force employed in developing countries.

There is no absolute acceptable way of capturing the prevalence and size of SE activities. Any attempt at estimating its size cannot reveal all dimensions of the phenomena because people engaged in such activities try to avoid detection at all costs suggesting its hidden nature (Schneider and Enste, 2000). For instance, participants will instead receive cash to cover up the trail of their transactions. The evidence of a cash-based economy is given by the amount of currency outside the banking system, which rose from ₦3.86 billion in 1981 to ₦14.95 billion, ₦1,082.30 billion, and ₦1,456.10 billion respectively by 1990, 2010 and 2015. During this period, currency outside the banking system was over 80 per cent of the currency in circulation, which gave credence to the presence of the SE. Although, persons aged 15 years and above who had an account with a financial institution increased from 29.66 per cent to 44.17 per cent within the period. In Nigeria, SE activities are visible everywhere, but the internal operations concerning records keeping are hidden from the relevant regulatory bodies. The mode of operation, especially as it relates to records keeping, which in most cases are non-existent or incomplete makes it challenging to capture their activities for official purposes (Aryeetey, Baah-Nuakoh, Duggleby, Hettige and Steel, 1994).

The incidence of dualism, whereby both the formal and the informal sector operate side by side, makes it difficult to draw a dividing line between both sectors (Fapohunda, 1985). In most instances, participants in the formal economy often resort to the SE to satisfy specific needs and vice versa. For instance, the SE dominates 55.7 per cent of activities in the trade sector (BudgIT, 2017). The SE also serves as a conduit for the sale of goods produced in the formal sector. In addition, most taxes and over 95 per cent of revenue generated by Local Governments (LGs) in Lagos were collected from the SE. The sector contributed over 40 per cent of Internally Generated Revenue (IGR) in the state.

The effect of the SE on the economy is inconclusive in the literature (Dell'Anno, 2007). On the positive side, it accounts for a significant share of jobs and revenue generation (Akerele, 1997; Abumere, Arimah, and Jerome, 1998; Folawewo, 2013). It also generates wealth, income and conceals the formal sector's inability to provide adequate employment. Alternatively, it poses challenges to the effective implementation of socio-economic policies and distracts workers away from the formal economy. The consequences are dire, as revenue shortfalls arising from reduced tax income results in the limited supply of public goods necessary for development to take place (Thomas,

1999; Frey and Schneider, 2000: Dell'Anno, 2007). The lack of consensus on the effects of the SE is a dilemma to policymakers because they are unable to determine the magnitude of SE permissible for economic growth. Despite the contrasting positions on the effects of the SE, the Nigerian government has been encouraging micro, small, and medium-scale enterprises, which are primarily informal, to remove challenges faced, increase productivity and boost economic growth (BOI, 2018). From the subtle support given to the sector in the various development plans carried out in the country to community banking in the early 1970s, to the Central Bank of Nigeria and Bank of Industry credit-based initiatives, to the most current, 'TraderMoni', the results have not been encouraging. The government-based policies aimed at the provision of credit have not had the intended results on increasing productivity over the years, instead, the SE has continued to grow.

Most firms and individuals in Africa operate in the SE. According to estimates by Abid (2016), 98 per cent of all new businesses start-up in the SE of Africa. The average size of SE in Africa (per cent of GDP) is 42.9 per cent. A further breakdown shows that the average size is 39.9, 40.02, 43.24, 45.5, and 45.21 per cent, respectively, in North Africa, Southern Africa, East Africa, Central Africa, and West Africa. This breakdown implies that the SE accounts for a significant per cent of national income. However, due to the manner of computation of national accounts, it remains unaccounted for.

Nigeria ranks among the top three countries with the largest shadow economy in the world (Medina and Schneider, 2018). The SE produced about 50 per cent of GDP before the 1970s, and by the 1980s, it had increased to over 65 per cent (Meagher and Yunusa, 1996). Schneider and Enste (2000) and Schneider (2005) estimated the size as ranging from 68 to 78 per cent between 1990 and 1993 and 59.4 per cent between 2002 and 2003. By 2015, the share of the SE (per cent of GDP) in Nigeria was 41.43 per cent compared with the formal sector that made up 58.56 per cent (NBS, 2016). The share of SE in the following sectors was significant and include agriculture (91.85%), trade (55.7%), accommodation and food services (52.1%), administrative and support services (47.1%) and real estate (64.8). Recent estimates by Medina and Schneider (2018) show the size of the SE averaged 56.7 per cent between 1991 and 2015. The impressive growth within this period coincided with rising unemployment, which peaked at 21.1 per cent in 2010. Despite the impressive growth of SE, GDP growth did not fare well as Nigeria only

enjoyed GDP growth rates above 10 per cent in 1970, 1971, 1974, 2003, and 2004. Negative GDP growth rates characterised 1975, 1978, 1981, 1983, 1984, 1987, 1995, and 2016.

Fluctuations in economic growth in Nigeria can be attributed to the continued focus on the petroleum sector. Structurally, the shift in attention from the agricultural sector to the petroleum industry following the oil boom in 1973 resulted in an imbalance, as individuals moved from the agricultural sector in search of limited employment in the formal sector, thereby increasing SE activities. The shift was partial in the sense that the agricultural sector was characterised by surplus-labour, while the booming sector had little labour absorptive capacity. The informal sector absorbed those excluded from the formal sector. At the national level, 13,563,427 persons were owners of informal sector businesses with the majority involved in the trade sector (NBS, 2010). Further, disaggregation by gender revealed the dominance of females (7,519,048 persons) compared with 6,044,379 males. The owners in Kano and Lagos states respectively were 1,590,669 and 837,919 persons. Easy entry into the SE gave rise to an increase in vulnerable employment, as government regulations on jobs were not enforced to cut costs. Vulnerable employment as a percentage of total employment averaged 80.96 per cent during the period 2005 to 2017. In 2019, the absence of pension contributions in the SE led the federal government to constitute a micro-pension scheme for the sector.

Given the pervasive nature of the SE of Nigeria, the ensuing questions emerge. What are the various dimensions of the SE? What are those factors influencing participation in the dimensions of the SE? How do these factors influence its size? What is the relationship between the formal and shadow economy? What are the effects of the size of SE on the economy and its implications for policymaking? These questions and related issues constitute the focus of this study.

1.3 Objectives of the study

The broad objective of the study is to explore the effects of different dimensions of the SE on the economy. The specific objectives are to:

i. Examine the factors responsible for various dimensions of the SE.
ii. Estimate the size of different dimensions of the SE in Nigeria.
iii. Analyse the effects of the SE on economic growth.

1.4 Justification for the study

Initial studies carried out by the ILO on the urban sector of Kenya and Ghana gave rise to the intense attention paid to the shadow economy in developing countries like Nigeria (Mabogunje and Filani, 1981; Fapohunda, 1985; Meagher and Yunusa, 1996; Folawewo, 2013). These studies are not enough to foreclose further studies on the subject. These studies focus on institutional distortions such as tax evasion (Allighan and Sandmo, 1972; Loayza, 1997; Schneider and Medina, 2018), government regulations (De Soto, 1989; Loayza, 1997), labour participation, and labour protection (Sethuramen, 1981; Folawewo, 2006). However, these studies ignored the micro-dimensions of SE, which are very important for understanding its pervasiveness in developing countries. The variables considered in the theoretical framework of most of these studies conducted did not adequately describe the phenomenon. The shadow economy is heterogeneous in nature. Therefore, any attempt at observing its behaviour must consider its diverse nature by carrying out a micro-study. While some micro dimensions examined included the absence of social security contributions, legal status, incomplete records keeping and size (Angel-Urdinabe and Tanabe, 2012; Collins, Mohammed and Alvaro, 2015). Little attention has been paid to the incidence of cash-based transactions, concealment, and harassment in the literature.

This study on the shadow economy is vital for understanding the drivers of its prevalence and its effects on economic growth. Several cross-countries, country-specific and sectoral studies have examined the shadow economy in Nigeria, especially as it relates to the dimensions, determinants, size, and implications for economic growth (Oni, 1994; Akerele, 1997; CBN/FOS/NISER, 2001; Salisu, 2001; Schneider, 2005; Obayelu and Uffort, 2007; Medina and Schneider, 2018). However, there has been no study on the country that incorporates both the micro and macro study of the SE. Initial studies on the phenomenon in Nigeria utilised the survey approach to determine the characteristics and reasons for participation (Fapohunda, 1985; Oni, 1994; Akerele, 1997; CBN/FOS/NISER, 2001). These studies investigated the incentives for participation and estimated the size of the SE within the context of informal firms. However, only point estimates of the size were obtained.

Attempts at obtaining the size over a period using cross-country studies included Schneider (2005) and Medina and Schneider (2018), while Ariyo and William (2011)

used the currency demand model to derive the size of the SE in Nigeria between 1975 and 2010. However, the caveat associated with these studies is the focus on a particular dimension of the SE. In reality, there are several dimensions of the SE, which needs investigation for relevant policy intervention. Policymakers and the government need information on economic agents who are actively involved in SE activities, the frequency of occurrence, and the size so they can take decisions.

The lack of consensus on factors causing the shadow economy due to differences in characteristics observed across countries implies that that models used may not be valid. For instance, most often, the illegal aspect, hidden nature, and tax evasion are emphasised for developed countries, while it is practised openly mainly for reasons of employment. Its activities in Nigeria are mostly legal, with less emphasis on tax evasion until recently (BOI, 2018).

Investigations have shown that financial development, the strength of the institutions in the country, the citizens' perception of the government in power, efficient tax administration, and low tax morale, are factors not taken into consideration by many of the existing studies (Loayza, 1997; Torgler and Schneider, 2007). Similarly, cash-based transactions dominate when financial development is low, which makes it hard to monitor economic activities. If the level of financial development is advanced, it could curb the incentive to engage in shadow economic activities. For these reasons, these factors are considered pivotal to any significant study on the SE in Nigeria as the coexistence of weak institutions, sub-optimal tax administration, and low tax morale further intensify the effects of the SE.

There are three known approaches for measuring the SE. They include the direct approach, the indirect and model approaches. Almost all the studies on the SE adopt one approach at a time in measuring the size of SE. These approaches or models apply to specific dimensions of SE. For instance, Loayza (1997) used the model approach; Ariyo and William (2011) used the indicator approach, while Medina and Schneider (2018) used a combination of the currency and the MIMIC model. Further assessment reveals that there is no agreement as to the appropriate measurement tool, as all known methods has its shortcomings. The failure to synthesise the approaches to have relative values of the size, depending on the characteristics being studied is also considered a caveat in earlier attempts to model the shadow economy. This study is important because different features

of the phenomenon entail a different approach. This study deviates from the previous studies by using the three approaches in the measurement of the dimensions of the SE to examine the factors determining various dimensions of SE and its associated size.

The literature is scanty on the connection between the size of the SE and economic growth in Nigeria. Some authors have obtained results that reveal the favourable effects of the shadow economy (Brambila-Macias and Guido, 2010), negative results (Loayza, 1997; Bajada, 1999), and mixed results (Wu and Schneider, 2019). The positivists are of the view that the participants are supported employment wise, spend some of their earnings in the formal economy while the pessimists believe that participation in the SE may lead to inefficient use of public resources, and further worsen economic outcomes. This study contributes to the literature by analysing the effect of the SE on economic growth in Nigeria, resolving any ambiguity regarding their interaction. It will also inform policymakers on the various dimensions of the SE and ways to harness its potential.

1.5 Methods of analysis

The theoretical basis for this study is the endogenous growth model. The model identifies the causal factors of the shadow economy and predicts that SE limits economic growth. A twin approach, which used the survey and macro-based models, was adopted. The survey approach involved analysing the outcomes of a survey carried out in Lagos and Kano states to identify the dimensions, determine the motives for participation based on the socio-economic features of the respondents, size of activities, and its effects on the economy. The analysis was carried out using simple frequency distribution tables, descriptive statistics, and the probit regression model.

The isolation of the macroeconomic determinants required using the MIMIC model and the currency demand model, respectively. To satisfy the objectives of the study, the results of both models were analysed for the drivers of the SE and combined to obtain estimates of the magnitude of the SE. The third objective was achieved by incorporating these estimates into the growth model to analyse its effects on the economy. The estimation techniques utilised included the Maximum Likelihood (ML) technique, Ordinary Least Squares (OLS) model and the error correction model. Preliminary tests comprise of the stationarity tests. The post-estimation tests for the models specified comprised of various ‘goodness-of-fit’ statistics and robustness tests.

1.6 Scope of the study

The various dimensions of the shadow economy examined in this study necessitated using both micro and macro-based approaches. The micro concept of the shadow economy was limited to specific sectors identified to be those where most SE activities take place, namely the manufacturing, wholesale, and retail trade, accommodation and food services, and transportation and storage activities (NBS, 2010). Besides, an evaluation of the extent of participation in illegal activities was investigated. However, criminal activities, and household services and production, were excluded from the investigation. The study concentrated on microenterprises that employ less than ten workers. Also of interest, were market clusters of businesses in the urban areas of Lagos and Kano states. According to NBS (2010), Lagos and Kano states are the states with the highest incidence of informal economic activities. The urban area was justified because it was where a significant number of shadow economy activities took place, and a significant percentage of those employed in the urban areas were absorbed within the confines of the shadow economy (Fapohunda, 1985).

The macroeconomic aspect of the study was concerned with shadow economy activities in Nigeria from 1970 to 2015. The 1970s represented a period of structural change in the economy away from the agricultural sector. This marked the beginning of significant shadow economic activities. In addition, from the 1970s to 2015, Nigeria experienced various policy regime changes with 1986 representing the radical change date. The period was characterised by unstable economic growth, culminating in the economy's inability to grow the formal sector.

1.7 Plan of the study

This thesis is divided into five chapters. Chapter one is the introductory chapter. The literature review follows in chapter two in which the conceptual review and background description of the shadow economy of Nigeria is undertaken. The related theoretical, methodological, and empirical literature are also reviewed in chapter two. The theoretical framework, model specification, and estimation techniques were developed and presented in chapter three. In chapter four, the results and findings were presented while the summary of findings, conclusions, policy recommendations, and limitations was discussed in chapter five.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual review of the shadow economy

In the literature, the SE is also known as the unreported, unrecorded, unobserved and informal, subterranean, underground, hidden, illegal, grey, clandestine, second, parallel and black economy amongst others (Feige, 1979; Bhattacharyya, 1990; Schneider and Enste, 2000). These concepts have similar meanings or can have different connotations, as seen in subsequent definitions. A distinguishing characteristic of the SE is that it is not observed directly (Hill, 2002). However, its causes, indicators, and effects are observable and can be used to calculate the size of the SE.

There is no agreement as to the definition of the SE in the literature. The SE is multifaceted, and the aspect being studied determines the definition (Gerxhani, 2004). Some reasons offered by Eilat and Zinnes (2000) are that a precise definition may be too narrow to reflect the various aspects of the phenomenon. Second, it may be method-specific and different country groups have different characteristics that preoccupy policymakers. For instance, OECD countries are faced with the problem of tax invasion, less developed countries, are characterised with the problem of the effects of regulation and cumbersome tax systems on small enterprises. The least developed countries in most cases do not have an internationally recognised statistical reporting and collection network.

The origin of the term comes from studies conducted on the urban sector of Kenya and Ghana (ILO, 1972; Hart, 1973). These studies were confined to studying the activities of self-employed persons and enterprises in the low productive urban sector. The informal economy is associated with artisan and micro-scale activities in developing countries (Batini, Kim, Levine, and Lotti, 2009: Eilat and Zinnes, 2000). These studies show that onerous regulations and taxes, which coexisted with inadequate public services and weak enforcement institutions characterised these countries. Batini et al. (2009) asserted that

informality is the consequence of bad public policies and represents the government's inability to promote an efficient economy. It also represented the response of an economy to shocks and growth challenges.

The SE is characterised by ease of entry, one-man, or family-run business, utilisation of indigenous resources, use of labour-intensive technology, adopted technology, a small scale of operation and low income (Sethuramen, 1981). Activities in the SE cut across almost all sectors of the economy, including petty trading, lending of money, building, transportation, manufacturing, and repairs. The shadow economy typically involves small businesses operating without registration, the roadside seller and the company that hires a percentage of its workforce with no formal agreement (Angel-Urdinabe and Tanabe, 2012). This view extends to units run by self-employed persons with other persons to generate a livelihood.

According to Angel-Urdinabe and Tanabe (2012), it is possible to study the shadow economy by observing firms, workers, and untaxed operations. The firm comprises employers and employees who work as self-employed persons, own-account workers, family business, in small-unregistered enterprises or private unincorporated enterprises. These enterprises typically produce goods and services to sell, employ fewer than five paid workers, are unregistered entities, and take part in non-farming activities (ILO, 2002). In contrast, Sethuraman (1981) stipulates the employment of fewer than ten persons to measure the size of SE, and it has been useful for enterprise surveys. Specifically, Nigeria has used this definition to qualify a firm as being shadow (NBS, 2009). Therefore, the SE can be conceptualised in terms of the number of employees. The individual (worker) as noted by ILO (2002) or the firm, which was the focus of ILO (1972), can carry out SE activities. The 17th International Conference of Labour Statisticians described informal employment as informal jobs performed in formal sector firms, informal sector firms, or households.

A large informal sector means that various activities that are supposed to be taxed are not taxed and has consequences for the revenue generation of the government. This may be due to escaping enumeration by relevant bodies. Hart (1973) claims that undertakings that evade enumeration operate in the SE. The SE is also the amount of all taxable income that has not been reported to avoid tax (Gerxhani, 2004; Schneider and Enste, 2000). There are four kinds of untaxed activities, namely informal activities,

underground activities, illegal activities, and household activities. The informal sector consists of firms and activities that operate outside the regulations of government (Loayza, 1997). Participation in informal sector activities causes participants to lose the privileges of being formal.[1] To circumvent the law, they continually divert resources to disguise their activities and engage in bribery.

Fewerda, Deleanu and Unger (2010) associated underground activities with criminal activities, while Feige (1990) described the illegal economy as involving income generated by economic activities undertaken without regards to laid down regulations. Lemieux (2007) defined the SE as 'where goods and services are created, consumed, and traded illegally'. Such activities include producing and distributing prohibited goods and services, such as banned drugs.

The SE is also defined as activities that evade the costs of regulations, but it does not include criminal activities (Loayza, 1997). Feige (1979) observes that the SE includes those economic activities that avoid the costs of taking part in the formal sector. However, they are excluded from the benefits of operating in the formal economy.[2]

Gerxhani (2004) used the following criteria, the political, legal, economic, and social criteria to capture the concept of the SE. The political and legal criteria include government regulation, illegal activities, and national statistics. The economic criteria include the labour market, tax avoidance, size of operations, occupational status, regulation of activities and national statistics. In the labour market, the SE includes all income-earning activities, which exclude those in the unregulated legal environment. The social aspect of the SE is concerned with social networks, ease of entry, and survival.

Feige (1990) described other components of shadow economic activities, including the unreported and unrecorded economy. George (1994) defines the unreported economy as comprising those economic activities that evade institutional rules such as paying taxes. Such actions affect government income, expenditure, debt, and tax reform policies. An outcome of the unreported economy is tax evasion, which has both macro and micro implications for the economy. First, it leads to seigniorage. Second, at the

[1]The privileges include access to the judiciary and police protection, access to formal credit institutions and participation in the international market (Loayza, 1997).

[2]According to Feige (1979), those engaged in shadow economic activities are excluded from the rules, rights, regulations, and penalties that govern the formal agents.

micro-level, the participants shift the burden to honest people, increasing the costs of compliance with the regulatory scheme (George, 1994). With different costs faced by different agents, the winners and losers of policy shifts are hard to identify. The shadow economy can be conceptualised in terms of the unrecorded economy as undertakings that avoid rules that specify the disclosure demands of statistical agencies, for instance, tax evasion (Tanzi, 1983; Bhattacharyya, 1990). The unrecorded income arises from the difference between overall national income and actual national income. This difference causes biased estimates of economic indicators. Information based on these indicators distorts the perception of economic activity, affects the behaviour of agents, and results from empirical research.

George (1994) conceptualised the shadow economy in terms of concealment and immorality. Schneider, Buehn, and Montenegro (2010) define the SE in broad terms as income earned from economic activities, which circumvent government regulations and are concealed. Concealment is the intentional cover-up of economic activities from the government. Activities are concealed to avoid; paying social security and taxes, labour market regulations (such as minimum wage, maximum working hours, and safety standards), and compliance with the administrative procedure (e.g. completing statistical or administrative questionnaires). This implies SE activities cannot be captured by national income statistics meant to monitor economic activity. The participants risk penalties if their activities are detected. Therefore, they develop a penchant for secrecy by using cash-based channels for transactions to hide the trail of activities, and this makes their behaviour challenging to study empirically (Cagan, 1958; Faal, 2003).

Schneider and Enste (2000), views the shadow economy as all unregistered economic activities contributing to officially computed GDP. They argue that the SE includes ‘illegal operations and unreported earnings from the production of legal goods and services’. The SE consists of unmeasured economic activities contributing to value-added activities (Bajada, 1999). Batini et al. (2009) focus on hidden income and the size of informal employment. Hidden income is referred to that portion of the income from legal activities, which are taxable but not considered in computing national income. A broader view includes the household economy, which involves unpaid family members. A summary of the shadow economy activities reviewed in this study is shown in Table 2.1.

Table 2.1: Types of shadow economic activities

Type of activity	Monetary transactions		Non-monetary transactions	
Illegal activities	Trading in stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling; fraud.		Barter of drugs or smuggled goods. Producing or growing drugs for own use. Theft for own use.	
Legal activities	**Tax evasion** Unreported income from self-employment. Wages, salaries and assets from unreported work related to legal services and goods.	**Tax avoidance** Employee discounts and fringe benefits.	**Tax evasion** Barter of legal services and goods.	**Tax avoidance** All do-it-yourself work and neighbourhood help.

Source: Lippert and Walker (1997)

Matters arising from the conceptual review

The discussion on the concept of the SE highlighted its various dimensions. Some dimensions identified include non-compliance with regulations, and non-registration (Loayza, 1997), cash-based transactions (Cagan, 1958), concealment of transactions and incomplete accounting records (Schneider, Buehn, and Montenegro, 2010). These dimensions are worth investigating in Nigeria. The definition of the SE adopted for this study refers to economic activities operating outside relevant government regulations. The focus is mainly on microenterprises that employ less than ten workers. Microenterprises make up the bulk of activities operating outside government regulations. At the macro-level, the focus is on currency demand and taxes. However, activities such as prostitution, drug trafficking, and armed robbery are not considered in conceptualising the SE.

2.2 An overview of the economy of Nigeria

The features of the Nigerian economy offer insight into the origins of the SE in the country. Before crude oil became commercially viable in Nigeria, agriculture was the backbone of the economy. The country depended on the agricultural sector for food, raw materials, employment, and foreign exchange earnings. Various policies and programmes such as FADAMA, Directorate for Food, Road, and Rural Infrastructure (DFRRI), Green Revolution and Mass Mobilisation for Social and Economic Recovery (MAMSER) were initiated to boost the agricultural sector. These policies and programmes directed at encouraging the agriculture sector were not too successful at achieving its objectives. This is observed given the net output of the sub-sector, as revealed by its value-added in Table 2.2. The value-added contribution to the sector is compared with other sectors such as manufacturing, industry, and services.

Table 2.2 reveals that between 1982 and 1986, the agricultural sector was the leading sector in terms of value-added contribution, followed by services, manufacturing, and industry. However, between 1987 and 1991, it lagged behind the other sectors. Its contribution grew from 2.76 per cent between 1992 and 1996 to 4.10 per cent between 1997 and 2001. The progress in the agricultural sector is attributed to the policy thrust, which aimed at diversifying the economy by encouraging agriculture. Apart from 2013, when the values fell to around 1992 to 1996 levels, the growth of the value-added contribution of the agricultural sector has not risen beyond 6.70 per cent attained in 2012.

As of 2014, the value contribution of agriculture and industry was not encouraging when compared with manufacturing and the services sector. By 2015, agriculture had declined to 3.72 per cent and industry to minus 2.24 per cent while manufacturing and services was minus 1.46 and 4.78 per cent respectively. The drag in the industrial sector was due to power outages and other constraints. The manufacturing and services sector, which emerged as leading sectors, have benefitted from deregulation and liberalisation policies, which propelled their growth. The massive import dependence of these sectors forecloses the achievement of a self-sustaining economy. The assumption that labour is the dominant factor of production in the country implies that more opportunities abound for employment in the services and manufacturing sector, respectively. As at 2016, all sectors yielded a negative value-added contribution except the agricultural sector, as revealed in Table 2.2.

Table 2.2: Valued added contribution of selected sectors (annual percentage growth)

Year	Agriculture	Manufacturing	Industry	Services
1982-1986	4.77	-1.44	-2.15	-0.68
1987-1991	4.03	6.86	5.94	6.52
1992-1996	2.76	-2.77	1.39	2.31
1997-2001	4.10	1.48	4.19	3.84
2002-2006	6.58	9.33	4.99	13.54
2007-2011	5.62	10.34	3.00	11.20
2012	6.70	13.46	2.43	3.97
2013	2.94	21.80	2.16	8.38
2014	4.27	14.72	6.76	6.85
2015	3.72	-1.46	-2.24	4.78
2016	4.11	-4.32	-8.85	-0.82
2017	3.45	-0.21	2.19	-

Source: World Bank (2018)

The emergence of the oil sector as a principal source of foreign exchange and revenue occasioned by the oil boom of the early 1970s caused a shift in attention from the agricultural sector to the oil sector, which has made the country vulnerable to oil price shocks. The resulting revenue shortfall led to increased pressure on alternative sources of income to the country, especially from the informal sector. The agricultural and the manufacturing sector were relegated, and shadow economic activities became pronounced. The economy has been influenced by external shocks ranging from oil price shocks, terms of trade shocks and debt crisis since the 1970s when it started exporting oil. Programmes such as the Structural Adjustment Programme (SAP) introduced to correct these problems resulted in mixed outcomes for macroeconomic indicators. The relegation and poor policy implementation in the manufacturing sector were made clear following the decline of capacity utilisation from 73.3 per cent in 1981 to 29.29 per cent in 1995, which was evident of de-industrialisation (see Table 2.3). From 2002 to 2010, capacity utilisation was above 50 per cent. This increase might indicate favourable policies. Although, some formal sector firms exited the country during this period to neighbouring countries. This decision was blamed on electricity outages and the high cost of operating businesses. Many firms that remained operated on the fringes of the law.

The protectionist stance of the country further worsened the state of the manufacturing sector. Ogun (1993) argued that the period preceding the first oil boom in Nigeria was characterised by the near absence of industrial structures, and a deteriorating Balance of Payments (BOP) to which the country responded by implementing protectionist policies. These policies included an import substitution policy as well as tariff protection. The success of these policies was truncated due to the poor management of the exchange rate that was fixed to an unstable British Pound Sterling and the US Dollar. This event culminated in an overvalued currency because of the rigid stance on the exchange rate. The problem of an overvalued currency led to the Dutch disease. The industrialisation policy was derailed, and imports exploded. Table 2.3 presents the five-year average of manufacturing capacity utilisation.

Table 2.3: Average manufacturing capacity utilisation (percentage)

Year	Average manufacturing capacity utilisation (%)
1981-1985	53.58
1986-1990	41.14
1991-1995	35.40
1996-2000	33.19
2001-2005	52.92
2006-2010	55.05

Source: Computed from CBN statistical bulletin (2012)

The World Bank classified the country as a low middle-income nation with a per capita income of $2,176 as of 2016. Despite this classification, the country remained the largest economy in Africa following the re-basing of its GDP in 2014. In 2014, GDP stood at $568.5 billion. The country's share of GDP in the West African sub-region was 77.6 per cent and 22.8 per cent in Africa. During the first oil boom era of the early seventies, GDP grew positively. However, in the 1980s, negative growth rates were experienced. The negative trend was attributed to the oil glut, the global economic crisis, and the mismanagement of the economy. After the period of structural adjustment and economic liberalisation, GDP responded partially to the policies put in place. The GDP growth rate, which shows the state of the economy, was not encouraging, especially before the year 2003. For instance, negative growth rates characterised the years 1975, 1978, 1981, 1982, 1983, 1984, 1987, 1991, 1995, and 2016. Except for the period 1970, 1971, 1974, 1990, 2003, and 2004, Nigeria, on the overall, has experienced a growth rate below 10 per cent. Figure 2.1 displays the behaviour of GDP growth over the period 1970 to 2017.

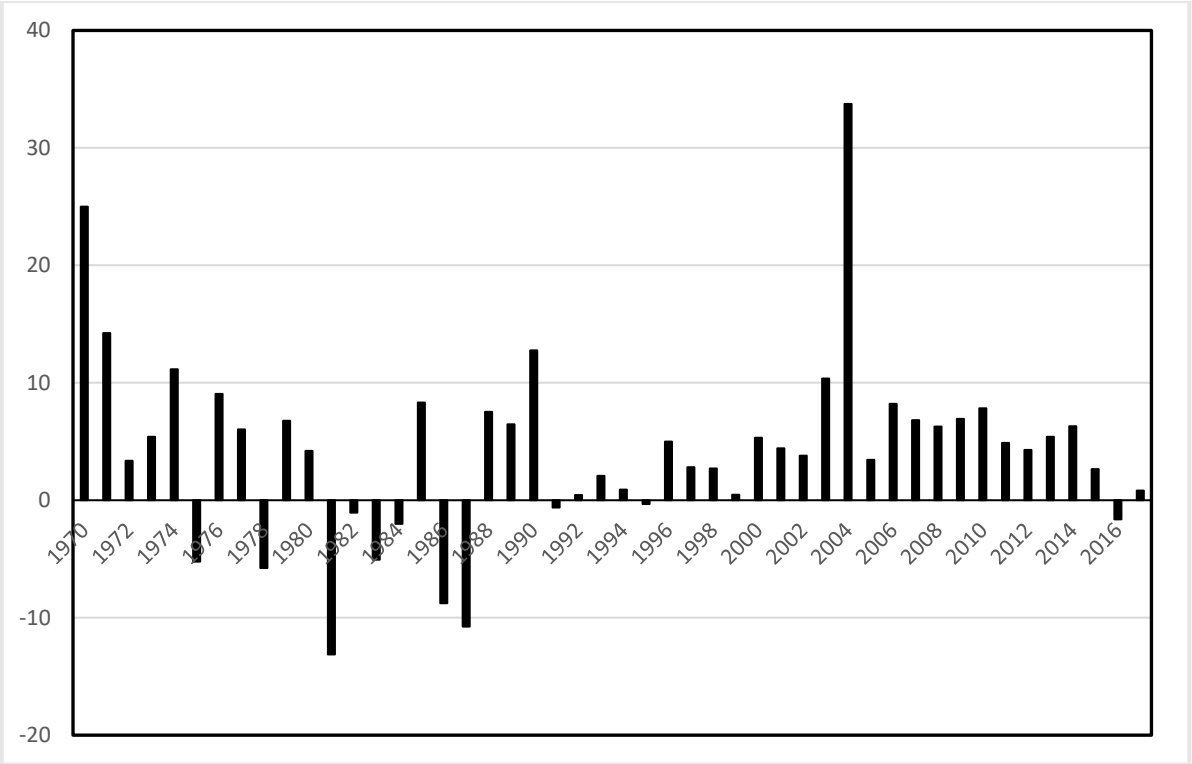

Figure 2.1: GDP annual growth rate (percentage)

Source: World Bank (2018)

The growth rates of imports and exports demonstrate that economic openness can induce economic agents to take part in SE activities. The CBN Statistical Bulletin (2012) shows that chemicals, manufactured goods, machinery, and transport equipment are the primary goods imported into Nigeria. The predominance of these goods reflects the import dependency of the manufacturing sector. The propensity to import is high, because, it is profitable to under invoice imports to avoid paying full duties on the imported items. Another instance of avoiding regulations is the incidence of goods being smuggled into the country to avoid paying full duties. Therefore, it is easier to trade in imported goods than to manufacture products domestically. An implication is that employment is created in other countries at the cost of the domestic labour market. Besides, oil exports dominate the exports sector. Figure 2.2 suggests that both imports and exports were unstable. The instability was because of different trade policies adopted over time, and unfavourable global events. The unsatisfactory performance of trade policies generated both internal and external disequilibria with implications, especially for government revenue and macroeconomic performance. Periods of oil boom are noted for raising the consumption level of both domestic and foreign goods. The growth rate of imports and exports, which spiked in 1987 and 1995, reflected an increase in demand. In contrast, the lowest levels of imports were obtained in the period 1988, which coincided with the oil glut.

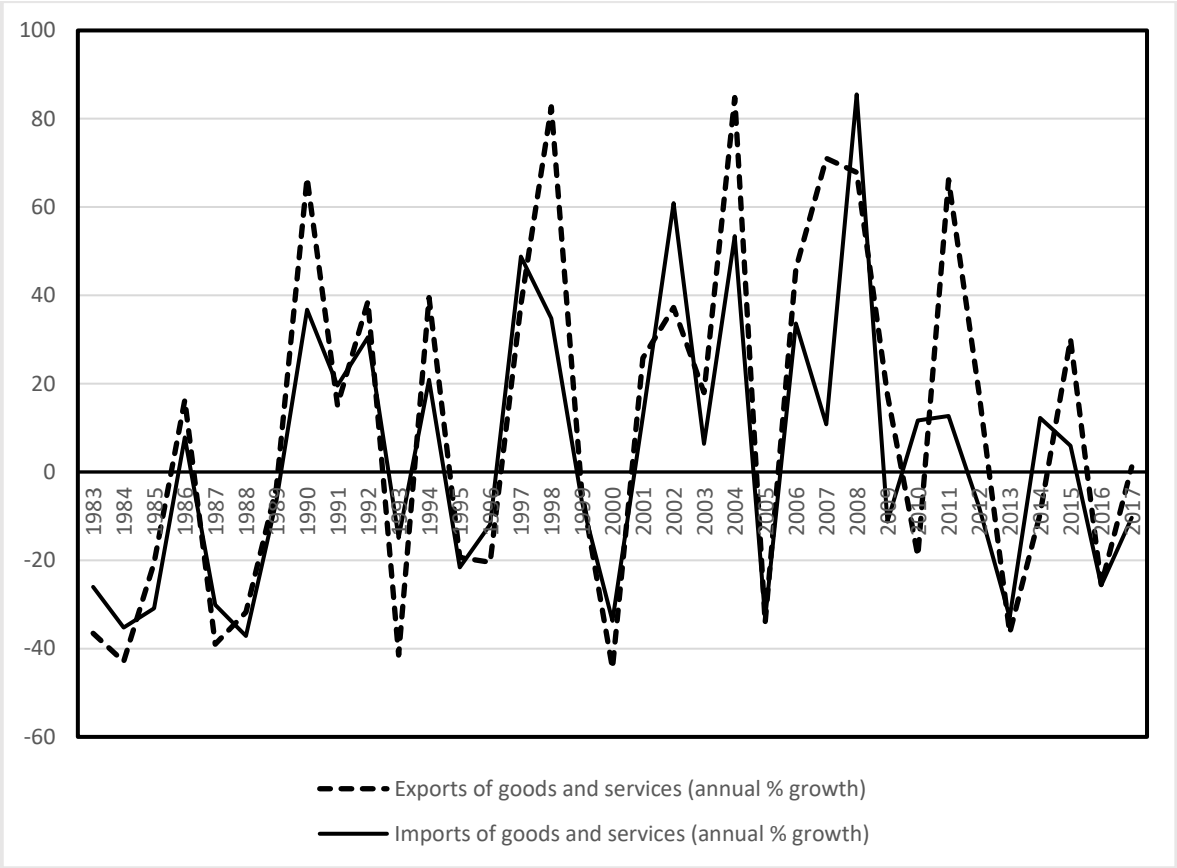

Figure 2.2: Percentage growth rates of total imports and exports
Source: World Bank (2018)

An outcome of the oil boom of the seventies was the ambitious goal of government to attain a degree of economic independence. This feat was achieved through the indigenisation policy. However, this heralded severe domestic workforce problems as foreign workers left. There was also less emphasis on tariffs as a source of revenue given the lucrativeness of the oil sector. Nigeria wasted the oil windfall of the 1970s, which led to decades of economic stagnation. Other reasons offered for economic stagnation were the implementation of inappropriate macroeconomic policies, corruption, and poor governance. An implication of the post-boom period for trade policy given the problems highlighted above was the increased level of smuggling activities, parallel market exchange rate, and an unprecedented level of unemployment (Ogun, 1993).

During the crisis of the early eighties, the country accumulated a colossal debt that ballooned over the years until 2006, when it paid the last instalment of a heavily discounted $30 billion debt it owed the Paris Club. The leading causes of the debt overhang were premised on the oil price glut and the sharp rise in interest rates in the early 1980s. The oil booms over the years resulted in a windfall of about $300 billion. This windfall gave rise to a significant appreciation of the exchange rate, which was pronounced in the pre-reform period (before 1986). However, the twin phenomena of falling oil prices and a sharp increase in the interest rate accounted for a high degree of inflation and debt rescheduling.

Before 1986, the fixed exchange regime was in operation, which ensured a relatively stable naira. In 1986, the country switched to a market-determined exchange rate regime. A vast difference between official and parallel market exchange rates subsequently increased the demand for foreign exchange and resulted in volatility in the exchange rate. The incessant demand for foreign exchange caused by excess government spending and dwindling export earnings caused a rapid depreciation of the naira, which has continued until date. This event, besides overvaluation of the currency before 1986, rendered exports uncompetitive in the world market given other structural defects of the Nigerian economy. Imports were also costly since most raw materials and machinery were imported, thereby impeding import-dependent businesses.

With the emergence of civil rule in 1999, several economic policies were designed to favour a faster-growing economy. For instance, before 1999, the Nigerian public sector was large and dominated the electric power, telecommunications, and petroleum and

mining sub-sectors. These sub-sectors account for a significant percentage of formal sector employment. However, policies aimed at liberalising, commercialising, deregulating, and privatising these sub-sectors have been constituted and are being implemented.

2.3 Review of the labour market of Nigeria

The labour market comprises wage employment and self-employment. Wage employment is relatively new in the country with more representation for males than females (Okoroafor, 1990). The bulk of the labour force is self-employed, implying that wage labour represents a small percentage of the labour force. The Nigerian labour market is dualistic, as it comprises the formal and informal sectors. The government influences wages in the formal sector, while market forces dictate that of the SE. In the wake of the global economic crisis of the early 1980s, and the recent recession experienced in the country, the labour market has struggled with problems of unemployment, downsizing of the public sector workforce, low employment capacity of the industrial sector, rural-urban migration, and a mismatch between labour demand and supply (Aminu, 2010).

The proportion of persons that make up the labour force is vital for understanding the dynamics of the population. The NBS study (2009) described the total labour force as comprising all individuals between the ages of 15 and 64 years exclusive of voluntarily unemployed persons. Figure 2.3 shows that, during the period 1970 to 2017, the proportion of people aged 15 to 64 years was between 52.5 and 54.6 per cent of the population. This suggests that despite population growth, the proportion of those in this age bracket has not significantly changed. It also demonstrates that the labour force constitutes a significant share of the population.

The population and household census of 2006 put Nigeria’s population at approximately 140 million, making her Africa's most populated nation. The population is currently projected at over 200 million people. This size implies a massive base of shadow economy participants, coupled with an extensive market for their goods and services. However, the population of the country is not distributed evenly. Lagos and Kano states respectively are the most densely populated states. Lagos, which is one of the sample areas, had a phenomenal growth in its population from 267,407 inhabitants in 1953 to

9,113,605[3] in 2006 (Fapohunda, 1985; NBS, 2009). Fapohunda (1985) attributed the increase to a high population growth rate and rural-urban migration[4]. Kano state had a population of 9,401,288 persons according to the 2006 population census. Both states have the highest incidence of SE activities at both the firm and household levels (NBS, 2009).

[3]Although, this 2006 figures is highly disputed by the Lagos state government, which claims a higher figure.

[4]Most of the migrants fall between the ages of fifteen to twenty four.

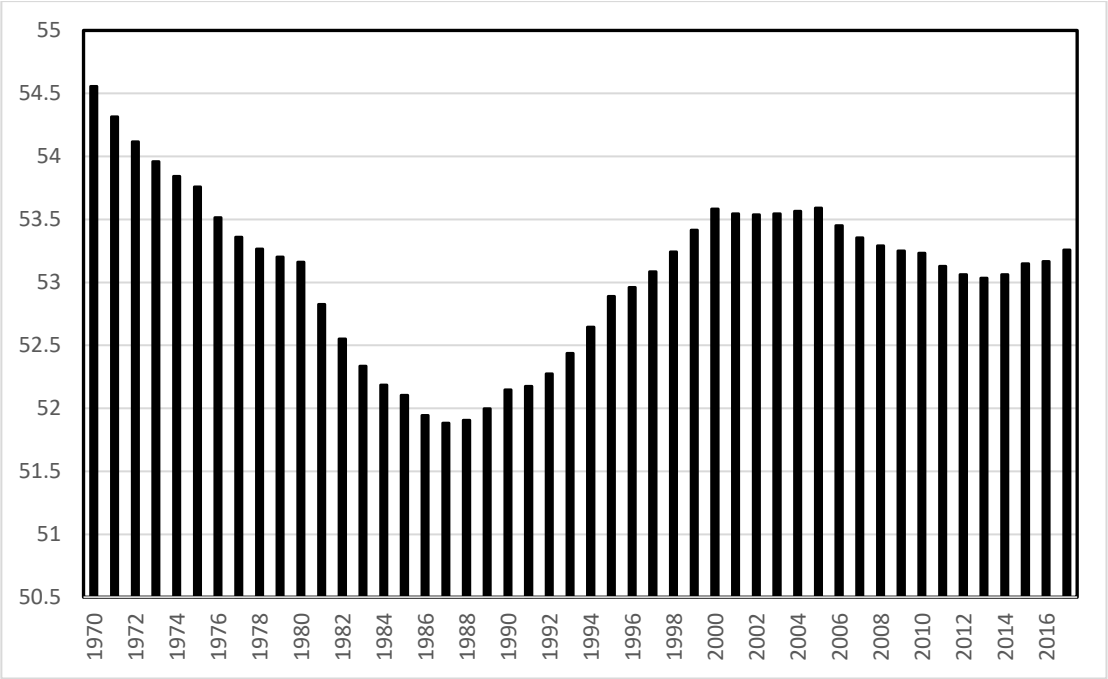

Figure 2.3: Population aged 15 to 64 years (percentage of the total population)

Source: World Bank (2018)

The employment to population ratio, which is an indicator of the labour market, shows that between 1991 and 1992, it fell from 53.41 per cent to 53.30 per cent. The decrease, though, was negligible (see Figure 2.4). It subsequently grew to 53.60 per cent in 1993, before dipping to 52.62 per cent in 2000. By 2004, it had dropped to 52.33 per cent. Subsequently, it rose to 53.06 in 2013 and thereafter fell to its lowest value in over twenty years. The value in 2016 and 2017 was 51.25 per cent and 51.3 per cent respectively. The employment-to-population ratio averaged 52 per cent over the period 1991 to 2017, indicating the population's employability.

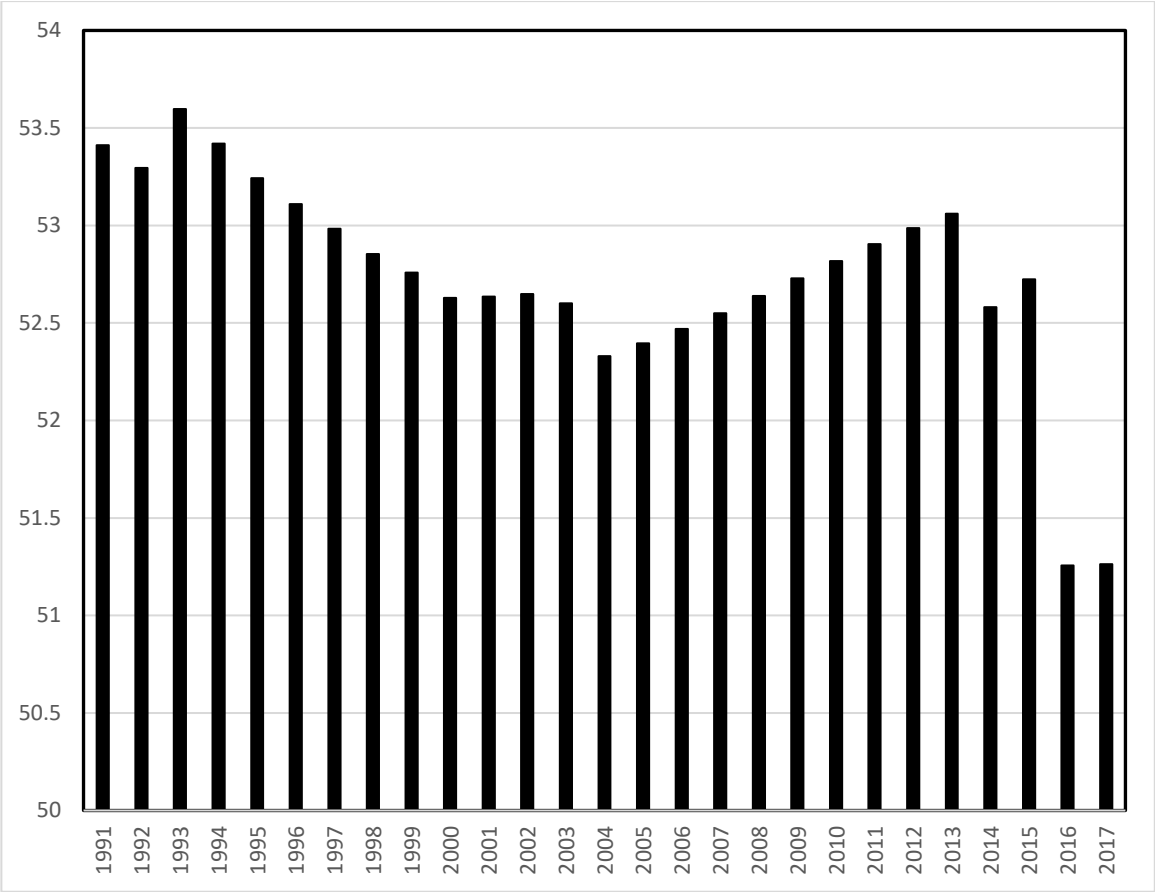

Figure 2.4: Employment to population ratio, 15 + (total percentage)

Source: World Bank (2018)

The rural-urban relationship portrayed in Figure 2.5 is another important determinant of the labour force trend. This trend has been converging over the period 1970 to 2017 due to the massive relocation of persons from rural areas to the urban areas and wage differentials. This trend is further compounded because the urban sector cannot absorb the persons, leading to these persons engaging in shadow economic activities for survival. Therefore, more unemployed persons live in urban areas as opposed to rural areas.

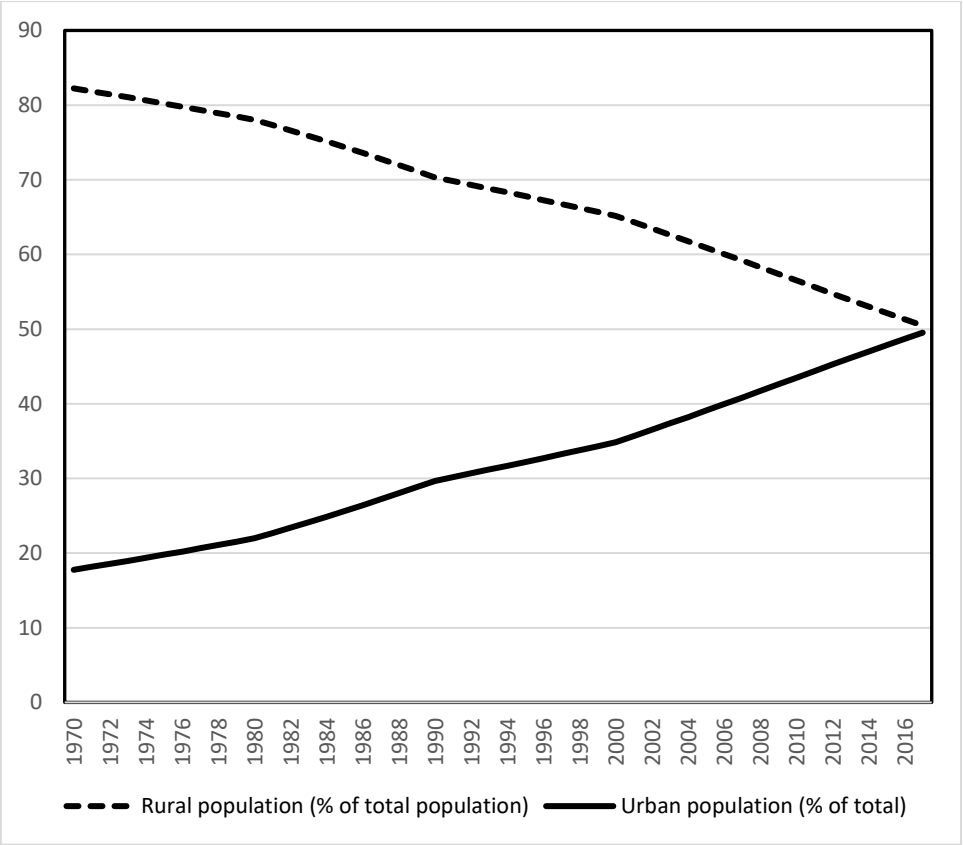

Figure 2.5: Rural and urban population as a proportion of the total population

Source: World Bank (2018)

The unemployment rate is defined as the number of persons available to work, but, did not work for a minimum of 39 hours in the week before the survey period (NBS, 2010). In Nigeria, the unemployment rate ranged from 13.1 per cent in 2000 to 23.9 per cent in 2011 (see Table 2.4). Within this period, the rate of unemployment rose sharply from 12.3 per cent in 2006 to 23.9 per cent in 2011. Reasons for the phenomenally high rate of unemployment include the annual turnout of graduates with no job placements, perennial retrenchment of civil servants, economic downturn, and industrial and agricultural policy failure. However, in 2013, the level of unemployment was lowest before peaking at 7.1 per cent in 2016.

Wage and salaried workers as a percentage of those employed were 16.7 per cent in 2000 before dipping to 13.9 per cent in 2002 (see Table 2.4). It rose slowly, reaching a peak of 19.4 per cent in 2013, before dropping again to 18.5 per cent in 2017. This suggests that a small percentage of workers hold; a paid employment job and written or oral contract. In addition, their remuneration is not totally dependent on revenue earned by the employer. This gives support to the high level of employment in the SE of Nigeria.

The quality of employment is described using vulnerable employment. It includes supporting household members and self-employed workers who make up a significant proportion of those employed. About 81.7 per cent of those employed are engaged in employment deemed to be vulnerable. Such jobs lack minimum protection for the workers involved and are characteristic of jobs in the SE. These outcomes are similar to those generated by the proportion of self-employment to those employed. Most self-employed workers are employed in microenterprises, which constitute the largest number of firms. The remuneration of these workers depends on the profit generated by the activities they engage in. An average of 82.6 per cent of workers is self-employed. Many self-employed workers are exposed to poor working conditions and poverty. An increase in the poverty levels of the country characterised the period 1980 to 2004. Poverty levels were highest in 1996 before falling in 2004, but the reduction was higher for the urban sector as opposed to the rural sector. The implication is that it is easier to reduce urban shadow economic activities than rural-based shadow economic activities. However, the trend in poverty has stagnated between 2004 and 2010 at 54.4 per cent

Table 2.4: Selected employment indicators in Nigeria

Year	Unemployment rate (%)	Wage and salaried workers, total (% of total employment)	Vulnerable employment, total (% of total employment)	Self-employed, total (% of total employment)
2000	13.1	16.7	82.4	83.3
2001	13.6	16.2	82.9	83.8
2002	12.6	13.9	85.4	86.1
2003	14.8	14.7	84.5	85.3
2004	13.4	16.2	83.0	83.8
2005	11.9	16.2	82.9	83.8
2006	12.3	17.2	81.9	82.8
2007	12.7	17.2	81.9	82.8
2008	14.9	17.0	82.1	83.0
2009	19.7	17.2	82.0	82.8
2010	21.1	17.9	81.3	82.1
2011	23.9	18.7	80.2	81.3
2012	3.8	19.0	79.9	81.0
2013	3.7	19.4	79.5	80.6
2014	4.6	19.3	79.6	80.7
2015	4.3	18.6	80.3	81.4
2016	7.1	18.5	80.3	81.5
2017	-	18.5	80.3	81.5

Source: 1. National Bureau of Statistics (2010)
2. World Bank (2018)

2.4 An Overview of the Shadow Economy of Nigeria

Meagher and Yunusa (1996) are of the view that the shadow economy of Nigeria evolved in the 1960s and 1970s when the formal sector was perceived as the stimulus for growing the economy. During this period, the shadow economy was perceived to be a temporary abode for the unemployed. However, instead of shrinking, it grew due to the neglect of the agrarian sector, oil boom, accelerated urbanisation, the rapid increase in growth of the labour force, contraction in public sector jobs, institutional constraints, and mismanagement of the economy. The importance of the shadow economy is brought to the fore by its comparison with other sectors of the economy and their contribution to the GDP. It is observed in Table 2.5, that the contribution of agriculture, industry, trade, services, and the SE to GDP was 20.68 per cent, 31.44 per cent, 13.56 per cent, and 56.95 per cent respectively in 1991. All sectors, except the trade, and services sector, slowly declined. The industrial sector experienced the most drastic decline from a peak of 33.33 per cent in 1992 to 16 01 per cent in 2015. On the overall, the SE contributed the most to GDP over the period 1991 to 2015, suggesting its importance as a veritable engine of growth. The percentage share of agriculture, industry, trade, services and the shadow economy in GDP is shown in Table 2.5.

Table 2.5: Percentage contribution of agriculture, industry, trade, services and the shadow economy to GDP

Year	Agriculture (% of GDP)	Industry (% of GDP)	Trade (% of GDP)	Services (% of GDP)	Shadow economy (% of GDP)
1991	20.68	31.44	13.56	31.05	56.95
1992	20.24	33.33	13.25	30.51	58.17
1993	23.46	29.06	15.49	29.45	58.82
1994	25.26	27.66	17.38	27.37	66.61
1995	27.29	29.78	18.30	22.73	62.21
1996	28.33	30.52	18.28	21.18	61.09
1997	29.46	28.49	18.46	21.77	60.69
1998	29.22	22.96	18.74	26.93	60.33
1999	26.89	24.76	17.70	28.58	59.87
2000	21.87	30.45	14.79	31.12	57.90
2001	24.78	24.16	15.28	33.79	57.64
2002	37.52	19.22	13.19	28.39	59.93
2003	34.48	21.82	13.41	28.53	57.19
2004	28.49	23.05	16.58	30.08	56.72
2005	27.09	22.81	16.23	32.01	55.84
2006	26.21	21.48	18.50	31.87	51.95
2007	25.92	20.61	17.85	33.40	54.96
2008	25.79	20.62	17.31	33.79	53.06
2009	26.25	16.97	17.83	36.02	53.98
2010	23.89	22.03	16.47	34.73	52.80
2011	22.29	24.81	16.39	33.48	51.51
2012	22.05	23.67	16.51	34.71	51.56
2013	21.00	21.99	17.11	36.56	51.70
2014	20.24	20.67	17.64	37.88	50.64
2015	20.86	16.01	19.15	40.29	52.49

Source: i. World Bank (2018)
ii. Medina and Schneider (2018)

The SE has evolved through various defining phases in the country's history. These phases include the period before the first oil boom of 1973, the period after the oil boom and just before the adoption of Structural Adjustment Policies (SAP) and post SAP. It evolved from shadow economy activities in the agricultural sector to self-employment, which has led to the growth of SE employment in the urban area. Over time, its transformation has been linked to economic developments in the country. This study shows that the shadow economy has evolved through three distinct stages. These stages include the pre-oil boom, post-oil boom, and post-liberalisation. During the period preceding the oil boom of 1973, the economy was primarily agrarian driven. The sector was susceptible to fluctuations in prices in the international market. It was also prone to natural events, which reduced output. The sector was also non-mechanised. The mainly informal agricultural sector was a significant employer of labour, especially in rural areas. Periods of non-activity and low income in rural areas prompted rapid urbanisation. In the cities, the industrial sector and the government sector were the major employers, but it was inadequate to absorb the migrants from the rural areas. Therefore, a new class of shadow economy workers engaged in all manner of economic activities emerged in urban areas. The government's preferential treatment of large firms to the detriment of small and microenterprises also characterised this period. Policies, infrastructure, and credit were skewed in favour of these firms. The global meltdown of the early 1980s led to the collapse of many large firms. It brought the deterioration of conditions in the formal sector to the fore with the attendant rise in the price level, wage freeze, and retrenchment of civil servants, which increased the rate of unemployment. As the price level increased, real wages fell, causing civil servants to resort to the SE to make ends meet. Declining government expenditure on social services constituted pressure on the already depressed economy.

In 1973, an oil boom occurred, shifting attention from the agricultural sector the primary source of income to the country. The oil sector, an enclave industry, had minimal economic linkage. Therefore, it did not generate the expected employment opportunities directly. However, it indirectly created employment opportunities through the now expanded government. The job openings in the government sector were also inadequate to absorb the ever-increasing urban unemployed workers. By the late 1970s, emphasis on state ownership, overvalued currency and poorly designed regulations all contributed to impeding formal private sector initiatives. Nigeria's balance of payment problems

following the international economic crisis of the early 1980s caused the country to seek a bailout. The adoption of SAP preceded the bailout. In encouraging manufacturers, the strategy emphasised the use of local products. Policies put in place to encourage the local producers included the establishment of industrial estates and the creation of various supporting institutions such as the People's Bank. Some of these policies and institutions, which were products of political regimes, were not sustainable. Therefore, the post-SAP era also did not fare better. It resulted in a rise in SE participants who did so for survivalist reasons and to avoid excessive regulatory requirements. It is not surprising that the number of workers working outside the confines of the official economy has been on the increase. The rising number of workers implies that the state of the economy has implications for activities in the SE.

The features of the SE discussed in this study are drawn from previous major surveys carried out on the SE of Nigeria (see CBN/NISER/FOS, 2001; NBS, 2009; NBS and SMEDAN, 2012). The SE employs a substantial number of the economically active population due to the failure of the official labour market to accept all job seekers. Activities in the SE cut across various sectors of which the retail trade sector is dominant. Although the size of operations is small, it still influences the economy because of the number of persons and enterprises involved. The businesses are usually one man or family-run businesses, of which the sole proprietorship dominates the ownership structure. Its workers who comprise unpaid family members and apprentices and a few paid workers remain unprotected. The vulnerability of workers is associated with a lack of access to a pension, which affects their old age. The lack of social protection has also been adjudged a reason for one-man businesses. The SE business fails to evolve to large firms because of constraints associated with its small size, which impedes its access to credit for expansion. Funds for operating the business mainly come from personal savings. The bulk of its activities are carried out by microenterprises, which sometimes operate from fixed structures or roving structures/persons that move with the demand for its products. In connection with the small size of enterprises in the SE, the informal sector is characterised by the minimal use of technology and innovation, low level of production and quality. These characteristics may be connected with the educational status of participants as illiterate and semi-illiterate individuals dominate the SE.

NBS (2010) provides survey-based information on the state of employment and activities in the SE of Nigeria. It shows the distribution of owners in selected sectors and the associated dominant gender in Table 2.6. Overall, the majority of persons (5,623,954) were involved in the trade sector, followed by manufacturing, accommodation and food services, agriculture, transport, and construction. The males dominated the agricultural, transport and construction sector, while, the females dominated the manufacturing, wholesale and retail trade and accommodation sector. Disaggregation by states revealed that Kano posted the largest number of owners at 1,590,669.30 followed by Lagos state at 837,919.00. The sum of both states constitutes about 17.91 per cent of the national figures. The composition of the owners reveals that working proprietor and or working active partners are the majority.

Table 2.6: Distribution of owners of microenterprises in selected sectors

Sector	Total	Dominant gender
Agriculture	963,115	Male
Manufacturing	2,284,647	Female
Wholesale and retail trade	5,623,954	Female
Transport and storage	639,787	Male
Accommodation and food services	1,363,882	Female
Construction	308,151	Male

Source: NBS (2010)

The incentives for involvement in SE activities are associated with the procedures needed for registration, fiscal burden and the state of the macro-economy. Challenges faced in doing business are associated with the time taken to register and the number of procedures. Despite government actions to reduce the days involved, the number of days needed to get a license to operate a business in Nigeria rose from 12.1 days in 2007 to 14.1 days in 2014 (World Bank, 2016). Time taken to start a business was 30.3 days in 2013. It dropped to 24.9 days and 18.9 days in 2016 and 2017, respectively. Start-up procedures to set up a business are usually an impediment for registration in the formal sector. In Nigeria, there have been some efforts to reduce these procedures. The number of procedures dropped from ten in 2003 to eight in 2009 and remained so until 2017. Start-up costs (per cent of GNI per capita) fell from 58.7 per cent in 2013 to 33.4 per cent in 2014 and 29.2 per cent in 2017. This suggests that the costs of formalising businesses have fallen. It is clear from the discussion that various measures have been put in place to reduce the bottlenecks involved in participating in the formal sector. But why do the SE still exist?

The fiscal burden affects the decision of individuals and firms to participate in SE activities. World Bank (2011) argued that the fiscal burden represented by taxes paid is essential to providing public amenities, infrastructure, and services crucial for the smooth running of the economy. It was also argued that countries with a high fiscal burden are characterised by the difficulty of paying taxes, high cost of tax, and a large share of informal sector activities. According to the report, Nigeria ranked 134 in the world regarding paying taxes in 2010. The marginal tax rate as a proxy of fiscal burden was 25 per cent for individuals and 30 per cent for corporate organisations in Nigeria. On making informal payments to public officials to hasten procedures, about 40.9 per cent of firms interviewed made such payments in 2007 (World Bank, 2011). These informal payments were paid to public officials to reduce bureaucracy regarding custom duties, taxes, licenses, regulations, and services. Labour tax as a percentage of profits steadily increased from 10.7 per cent in 2013 to 12.1 per cent in 2015 and 13.5 per cent in 2017. The time taken to prepare and pay taxes declined from 429.4 hours in 2014 to 360.4 hours in 2017. Intuitively, the stance of the government is to reduce the time and effort used to prepare tax returns. Overall, the country ranked 181 out of 189 nations on the ease of paying taxes and ranked 59 on the ease of obtaining credit (World Bank, 2016). This high figure demonstrates the attractiveness of going shadow. Also, since the shadow economy is

linked with non-declaration or partial declaration of income, in Nigeria, the proportion of firms not reporting all transactions for taxation was 68 per cent of the total firms as at 2007 (World Bank, 2016).

Often, too many regulations and bureaucracy result in a large shadow economy (Schneider, 2005), although evidence sometimes contradicts this stance. Table 2.7 shows some selected indicators on the ease of doing business in Nigeria and compares it with Sub-Saharan Africa and high-income countries. Table 2.7 reveals that total tax and labour tax contribution as a proportion of profits is higher in Sub-Saharan Africa and high-income countries when compared to Nigeria (Lagos and Kano). Nigeria is still, however, one of the world's largest shadow economies. This size is because most economic operators in the SE do not pay a labour tax to boost their profits. However, regarding the profit tax and the number of payments per year, the country has higher figures posted.

Table 2.7: Selected tax based indicators

	Kano	Lagos	Nigeria	Sub-Saharan Africa	High income countries
Total tax (% of profit)	33.3	33.4	33.4	46.5	41.2
Profit tax (% of profit)	20.8	20.8	20.8	17.8	14.9
Labour tax and contribution (% of profit)	12.1	12.1	12.1	14.1	24.1
Payments (number per year)	59.0	59.0	59.0	38.6	11.1

Source: World Bank (2016)

Note: The figures for Nigeria is computed as a simple average of figures for Lagos and Kano states

2.5 The policy environment of the shadow economy

The policy environment surrounding the SE has been favourable as the government has been giving both credit and tax-based incentives to the shadow economy in recognition of its role as an engine of growth. Government policies and initiatives to encourage SE activities range from promoting access to credit and land, providing infrastructure, technical and managerial services, and other tax incentives. These credit-based incentives aim at encouraging SE participants to enter the formal sector structure. However, the benefits derived are skewed in the interests of big enterprises. Government efforts at providing funds, frequently fail due to policy lapses and ineffective targeting which diverts benefits to unintended beneficiaries (Ogwumike, 2001). In addition, infrastructural deficiencies, which is evidence of government failure adds to running costs (Adenikinju, 2005).

Some of the interventions by the government as discussed by Abumere et al. (1998) includes the Companies Act, Labour Act, Worker's Compensation Act, the Nigerian Standards Decree, the Enterprise Promotion Act, the Trade Union Act and the establishment of Community banks now Microfinance banks. Others include the Nigeria Bank for Commerce and Industry now Bank of Industry; initiatives carried out by the National Directorate of Employment and Central Bank of Nigeria.

The policy environment examined in this study includes the credit-based schemes and tax environment.

2.5.1 Credit based schemes

The government, in partnership with the Bank of Industry, the Central Bank of Nigeria, SMEDAN and the organised private sector, has put together many credit-based schemes. However, attention has been directed at the small and medium enterprises, while microenterprises, which make up approximately 90% of the country's firms, were neglected (BudgIT, 2017). Therefore, recent schemes such as the Government Enterprise and Empowerment Programme (GEEP) if properly managed will put an end to difficulties faced in accessing credit by microenterprises and self-employed individuals. Some schemes in operation in Nigeria are briefly discussed and shown in Table 2.8.

Table 2.8: Selected credit-based incentives to promote the SE

S/N	Scheme/institution	Objective(s)
i.	**Nigerian Enterprises Promotion Decree** enacted in 1972 and amended in 1977	To aid changes in the ownership structure of companies in the country and to offer indigenous businesses the opportunity to gain control of the economy
ii.	**The rural banking scheme instituted by the Central Bank of Nigeria in 1977, later community banks and Microfinance policy, regulatory and supervisory framework for Nigeria created in 2005**	To make credit available to persons at the grassroots, while the microfinance policy was to create viable microfinance banks capable of mobilising and channelling credit.
iii.	**National Directorate of Employment (NDE) established in 1987**	To offer training to those out of work.
iv.	**People's bank set up in 1989**	To meet the credit needs of the rural and urban poor.
v.	**Small and medium industry equity scheme (SMEIEIS) created in 2001**	To tackle the problem of inadequate access to long-term credit. Banks had to develop viable businesses and set aside 10 per cent of profit for equity investment.
vi.	**Small and medium enterprises development agency of Nigeria (SMEDAN) created in 2004**	To ease the formation, revitalisation and encouragement of micro, small and medium-sized enterprises ' growth and development.
vii.	**Small and medium-scale enterprises credit guarantee scheme (SMECGS)**	To fast track the development of enterprises and set the pace for industrialisation and increase access to credit.
viii.	**N200 billion SME restructuring/ refinancing fund managed by Bank of Industry**	To increase credit access to SMEs.

ix.	**₦100 billion Cotton, Textile and Garment (CTG) fund established by the government and managed by the CBN**	To provide credit for the resuscitation and revival of the textile industry.
x.	**National Economic Reconstruction Fund**	To boost access to credit.
xi.	**₦5 billion Dangote fund for Medium, Small and Micro Enterprises (MSMEs)**	To increase access to credit with the government's collaboration with the private sector.
xii.	**Lagos State Entrepreneurs Trust Fund (LSETF) created in 2016**	To tackle unemployment, make funds available and support the creation of wealth.
xiii.	**Government National Social Investment Programme (N-SIP)**	It is a grants program of the government targeted at shrinking poverty and unemployment.
xiv.	**Government Enterprise and Empowerment Programme (GEEP).**	This is an initiative of the government and Bank of Industry designed to grow the Nigerian economy by providing micro-credit loans. These loans are repayable over six months. It comes in three forms namely; 'MarketMoni' which supports petty traders with loans ranging from ₦50,000 to ₦100,000, 'TraderMoni' also supports the petty traders with loans ranging from ₦10,000 to ₦100,000, and FarmerMoni which targets farmers with loans ranging from ₦300,000 and ₦2,000,000. These initiatives are useful for their low interest and a fast payout of loans, although it is characterised by many documentations.
xv.	**Campaign to patronise products produced in Nigeria**	To stimulate and make the medium, small, and microenterprises more competitive.

2.5.2 The tax environment

Nigeria's tax revenue to GDP is one of the world's lowest at 6 per cent (World Bank, 2018). The SE of Nigeria constitutes a significant proportion of GDP, but there is no evidence of how much taxes it generates. The existence of the SE suggests that the government is losing tax revenue worth billions of naira. The government is faced with challenges of collection of taxes from the SE, as the participants are evasive and reluctant to pay taxes to the government (Odusola, 2006). The factors responsible for low tax revenue include the dominance of the government's revenue by oil receipts, low tax literacy rate, poor records keeping, low tax morale, the belief that government is corrupt and limitations faced by the tax agencies. Others include multiple taxes, failure of the government to provide necessary social and economic infrastructure, and defective tax sharing formula that does not prioritise efforts in collecting taxes.

The tax environment of the shadow economy is vital for understanding why participants avoid paying taxes. Nigeria operates a three-tier tax structure that is divided between the federal, state and local government. These tiers have their jurisdiction stated in the 1999 constitution. There are various types of taxes, which are collected by three categories of tax authorities, namely the Federal Inland Revenue Service, the State Board of Internal Revenue, and the Local Government Revenue Committee in Nigeria.

The taxes under the federal jurisdiction are strictly out of bounds for SE firms, while selected taxes at the state and the local government levels are unavoidable. Such levies and taxes collected by the State and Local Government include tenancy rates, shop and kiosk rates, motor park fees, market levies and taxes, and fees for permits for signboards are usually not avoidable.

Most of these tax laws introduced in the early 1990s have been amended over time. The tax laws in operation in Nigeria include the personal income tax Act, the company tax Act, value-added tax Act, petroleum tax Act, and the withholding tax Act among others. The Federal Government, through the Federal Inland Revenue Services, administers the taxes discussed in Table 2.9. Microenterprises or individuals involved in SE rarely pay these taxes. The tax acts are briefly discussed in Table 2.9.

Table 2.9 Selected taxes in operation in Nigeria

Types of Taxes	Remarks
Personal Income Tax Act (PITA)	It is the oldest form of tax and was introduced as a poll tax in 1904 to Northern Nigeria. By 1917 and 1928, respectively, it was extended to the western and eastern region. It was later incorporated into the 1940 Direct Taxation Ordinance, 1961 Income Tax Management Act, which later transitioned to the PITA in 1993 and was revised in 2004 and 2011. The law empowers tax boards and their officials to identify and assess taxable individuals. There are two ways of assessing the personal income tax, which is a pay-as-you-earn (PAYE) and direct assessment. PAYE is taxes deducted at source by the employer. Self-employed individuals pay a direct assessment. This tax is levied at graduated rates ranging from 7 per cent to 24 per cent.
Company Income Tax	The company income tax was introduced by law in 1939 and later revised in 1961. It was codified into the income tax act of 1990. The tax is levied at 30 per cent of the taxable profits of a company operating in Nigeria.
Value Added Tax	This is an indirect tax regulated by the VAT Act of 2007. It is charged at 5 per cent on the supply of goods and services except those that are excluded. It has been increased to 7 ½ per cent in the Finance Bill of 2020.
Petroleum Profit Tax	This is a tax levied on the profits of companies involved in petroleum activities. It is charged at 85 per cent of income.
Education Tax	It is a tax charged at 2 per cent on a company's profits.

National Information Development Levy	This is a levy imposed on telecommunications, internet companies and financial institutions at 1 per cent of profit before tax.
Stamp Duties	This is a tax imposed on legal instruments, especially on the transfer of assets.
Capital Gains Tax	It is a tax on profits made from the sale of capital assets.
Withholding Tax	It is deducted at source from income received for services rendered or from investment.

Source: FIRS (2019)

The participants in the SE have been the focus of tax policies. Odusola (2006) claimed that the tax policies before the 1980s focused on protecting local industries, utilising local content in the production process, and generating revenue, while the post-SAP period focused on promoting exports and reducing the tax burden. Most of the local industries operated in the SE and were characterised by their use of local content. The National Tax Policy (NTP) introduced in 2012 and revised in 2017 recognised the importance of the informal sector as a source of revenue to the government. Among its priorities was the plan to improve the country's rating in terms of ease of paying taxes, coordinate the relationship between all tiers of the government collecting taxes and agencies engaged in the collection of information, and a reduction in multiple taxes and tax rates. The NTP was a deliberate plan to increase tax revenues via a shift from direct taxes to indirect taxes. By implication, the move to indirect taxes suggests that individuals and firms in the SE would be taxable through their consumption of goods and services. Intuitively, the tax net will be expanded, and more revenue will accrue to the government.

The NTP was implemented to stimulate economic growth and investment. It relied on the voluntary assessment of income tax and total assessment of comparable businesses. In 2017, the Voluntary Assets and Income Declaration (VAIDS) was introduced for nine months. VAIDS offered individuals and firms the opportunity to declare assets and income voluntarily to the tax authorities in return for amnesty. The purpose of the amnesty was to bring more individuals and firms into the tax net and expand the revenue base of government.

Tax incentives are often offered to registered companies to encourage investment. However, SE firms are unable to benefit given their status. Some tax incentives on offer in Nigeria include pioneer status, free trade zones, infrastructure relief, research and development claim, capital and investment allowance, exemption of profits from exports, small and medium scale enterprise and agro-allied incentives. These are explained below;

i. Pioneer status – Is an incentive that qualifies a company for a three to five years tax holiday.
ii. Free trade zones and Export Processing Zones (EPZs) – This is an incentive extended to all new firms in an EPZ. It allows full tax exemptions from tax liabilities as long as 100 per cent production of the firm is for exports.

iii. Infrastructure relief – For companies that provide essential infrastructure, this relief is available. It is offered on the provision of tarred roads, water, electricity and all infrastructure at a rate of 15 per cent, 30 per cent, 50 per cent and 100 per cent, respectively.

iv. Research and development claim – This is granted to companies involved in research and development operations. The claim is tax-deductible.

v. Capital and investment allowance – Capital allowances are claimed on qualifying expenditure, and a company can claim up to 100 per cent cost on the acquisition of an asset.

vi. Exemption of profits made from exports from income tax – This is possible as long as proceeds from exports are repatriated back to Nigeria and used to buy goods used in the production process.

vii. Small and medium-scale enterprises equity investment scheme – The scheme requires that banks set aside 10 per cent of profit after tax for equity investment and promotion of small and medium-scale enterprises.

viii. Agro-allied incentives – These are incentives used to stimulate investment in agricultural activities. For instance, to increase local production, import duties on certain agricultural products such as rice were increased.

Despite these incentives, the bulk of SE firms have failed to make the transition to the formal sector. Their registration status excludes them from enjoying the benefits that accrue from these tax-based incentives. Therefore, the exclusion of SE activities from the gains of the incentives in place needs to be addressed within the confines of the theoretical literature.

2.6 Review of theoretical literature

The theoretical literature on the relationship between the shadow economy rests on various strands of literature relating to schools of thought, tax evasion, financial development, and growth.

2.6.1 Schools of thought on the shadow economy

There are three dominant schools on the nature of the SE (Chen, 2005). They include the dualist, structuralist, and legalist schools. The dualist school, which was popular in the 1970s, argues that SE activities persist because the excess labour from the

subsistence sector is not fully incorporated into the formal sector (Lewis, 1954; Harris and Todaro, 1970; ILO, 1972). This incidence is due to a sluggish economic growth rate accompanied by a growing population. Early studies conceptualised the SE in terms of the dual economy and social marginalisation of certain persons in society. Activities in the SE were marginal with the poor and the unemployed involved.

The structuralists argued that the nature of development caused the persistence of the SE (Castells and Portes, 1989). The reason was that the economic units in the SE reduced expenses, and thus increased the competitiveness of big companies. This implied that both coexisted, and had a symbiotic relationship. The legalist school popularised by De Soto (1989) perceived that SE activities persist due to costs, time and effort to register formally, which was caused by government regulations (De Soto, 1989; Loazya, 1997). While the procedures associated with formal registration were beneficial to the large firms, it did not favour the small and microenterprises. Therefore, it was rational for the microenterprises to participate in SE operations to avoid the costs of formalisation. Participation according to the dualist and structuralist school is attributed to exclusion, while the legalist school links it to choice.

2.6.2 Models of individual and a firm's motivation to participate in the shadow economy

On the relationship between the SE and the economy, models involving the individual and the firm are considered. Romero (2010) presents a model on the incentives that spur individuals to participate in the SE. There is a fixed population *N*, comprising of persons living in two periods. These individuals inherit income from their parents, *b*, and choose a profession from the following choices, entrepreneurs, workers or unemployed. The proportion consumed from their wealth is $(1-\beta)$, and it lies between zero and one. The utility preference for consumption and inheritance $U(x,b)$ is;

$$U(x,b) = (1-\beta)\log x + \beta \log b \qquad (2.1)$$

The economy is a single good economy that can be produced in the formal sector, *A* or in the shadow economy, *B*. In sector *A*, the owners of businesses are expected by law to register with the tax office, pay a fixed fee, *F* and a tax rate of τ^{ρ} and τ^{s} proportional to returns of the firm and salary of the worker, respectively. An employee receives a net wage of $S^{A}(1-\tau^{s})$ and S^{B} (since he evades taxes) in sectors *A* and *B*, respectively. An

unemployed person produces γ to survive, and it is not subject to taxation. Entrepreneurs at time *t* use all their initial wealth w_i, to offset the costs of acquiring machinery to set up the business. However, if the entrepreneur has access to credit, it will increase the scale of production.

The credit market model is based on the intuition that banks require borrowers to register with the tax office besides providing collateral. So, the entrepreneur offers collateral, $\sigma + \hat{\alpha}_i^{A} \sigma$, which is the value of his initial wealth, w_i, less the fee paid for registration, *F*. This is represented as;

$$w_i - F = \sigma + \hat{\alpha}_i^{A} \sigma \tag{2.2}$$

The interest rate is fixed over time. Therefore, once the project is set up, if the entrepreneur tries to default on payments, the bank forecloses default by seizing the collateral. Hence, if the entrepreneur evades taxes and payment of the registration fee, his application is denied, and so he borrows from the informal lending markets. The differences between both markets are in costs and type of collateral. The informal credit market, however, is burdened with the added cost of monitoring each debtor. Therefore, a person will prefer to be an entrepreneur in sector *B*, if the project yield outweighs the worker' earnings.

The second model considered is a model of an entrepreneur's choice to participate in the SE by Friedman, Johnson, Kaufman, and Ziodo-Lobaton (2000). The entrepreneur chooses between operating in the formal economy or diverting resources to the SE. If he operates officially, his earnings from investments are *R (T) >1*, where tax revenue is represented by *T*. The tax rate on earnings is *t*. Regulation is represented by *r* and is levied per unit of output. If resources are diverted, it generates *D*, which is not used optimally in the production process. The cost of operating in the SE is $kD^2/2$, where *k* represents the effectiveness of the legal system. *R (T)* is the efficiency of the formal sector, and the level of tax revenues determines it. So, if tax revenues are used optimally, productivity is enhanced.

Another entrant to the model is the government. The government has two functions; to provide public goods and enforce the law. If *k* is high, there is a higher penalty for participating in the shadow economy. Therefore, if expectations are high

concerning *k*, the government will raise more revenues to finance a higher level of *k*. The utility maximising function of the entrepreneur is given as;

$$Max\underset{D}{U}(D,R,k,t,r) = Max[(1-t-r)(Y-D)R(T)+D-(KD^2/2)] \quad (2.3)$$

If differentiated with respect to *D* and rearranged, the optimal sum of earnings diverted *D** is obtained;

$$D^*(R,t,r,k) = (\frac{1}{k})(1-(1-t-r)R(T)) \text{ If } D^* < Y \quad (2.4)$$

Where *Y* is retained earnings. It is assumed that *(1-t-r) R (T)* is less than one, due to the motivation to divert part of the earnings into the shadow economy. The implications are that more bureaucracy and higher taxes increase such incentive. In the case of taxes, the incentive depends on the initial equilibrium conditions. Bureaucracy does not generate revenue for the government. Therefore, this model suggests that taxes have two effects: direct and indirect effects. The direct effect raises the motivation to conceal activities while the indirect effect encourages production in the formal sector because of the provision of an enabling legal environment.

2.6.3 Models of tax evasion

Other related models of participation in the SE include the model of time allocation by Becker (1965), Allingham and Sandmo (1972) tax evasion model and a combination of the theory of tax evasion and time allocation by Isachsen and Strom (1980).

i. Model of time allocation: Becker (1965) articulated a model on allocating time between different activities. In the model, people split their time between work and leisure according to their choices. It does not distinguish between regular and illicit work. Therefore, the theory can be extended to the shadow economy where time spent on leisure and work is divided optimally between the official and Shadow economy.

ii. Model of tax evasion: Allingham and Sandmo (1972) carried out the ground-breaking work on tax evasion. The model analysed the decision of the taxpayer to evade paying taxes by deliberately not reporting his income in full. The decision to pay taxes is a decision under uncertainty in the sense that it does not automatically result in a penalty. Actual income is the decision variable of the taxpayer, and the tax authorities do not know it. Inadequate information puts the tax authorities in a dilemma as to who is most likely to avoid taxes. However, since the authorities know the profession of the taxpayer; the

taxpayer is investigated if he declares an income lower than the average for his profession. Given this, the individual has to choose between two strategies; reporting his actual income or declaring less than his actual income. His payoff under the second strategy depends on if the tax authorities probe him. If he is probed, then he is worse off, and if not is better off. Besides, his reputation may be negatively affected if detected. Therefore, tax evasion can be controlled by the imposition of a penalty and a perceived high probability of detection.

Concerning the shadow economy, it is apparent that if the penalty imposed and the risk of detection is low, then the shadow economy will keep growing. Those involved in the shadow economy are those who have to bear a higher tax burden if their entire earnings are declared, so only a portion is declared to reduce costs and increase profits. If on the other hand, the penalty imposed and the risk of detection is high, and this is accompanied with low tax morale, the individual caught may not have his reputation negatively affected as predicted by the model.

iii. Combination of the tax evasion and time allocation model: Isachsen and Strom (1980) combined both models and concluded that tax evasion results from a high marginal tax rate, which increases SE work.

2.6.4 Financial development and the shadow economy

Bose, Capasso and Wurm (2008) analysed the connection between SE and financial development. The argument proceeds because when an individual needs credit for production or consumption purposes, he must decide the percentage of his income to declare. His income is subject to taxation and is used as collateral to get a loan from a borrower. Therefore, if the level of financial development were low, giving rise to a larger shadow economy, he would be tempted to under-declare his income. A low level of financial development is characterised by scarce loanable funds, lack of rivalry between financial intermediaries, financial repression, and the limited ability of lenders to collect and process information. Hence, the individual is not motivated to declare his entire assets since it does not have much impact on the terms and conditions of credit.

2.6.5 The shadow economy – growth nexus

Barro and Sala-I-Martin (1995) identify three significant strands of thought in the history of modern growth theory; growth models with consumer optimisation (Ramsey

model), growth models characterised by exogenous saving rates (neoclassical models), and endogenous growth models (AK models). The endogenous growth model arose from the shortcomings of previous models to address the determinants of long-run growth. None of these growth models originally considered the SE in their analysis.

As discussed earlier, the effects of the SE may be beneficial or otherwise. The effects of the shadow economy on the entire economy have been addressed within the confines of the endogenous growth model (see Loayza, 1997). Loayza (1997) discussed the rationality of being formal taking into consideration the costs and benefits of SE. The framework follows closely earlier works by De Soto (1989), Rauch (1991), Barro, and Sala-I-Martin (1995). An endogenous AK-type model with constant returns to capital is used. Both the formal sector and SE agents are assumed to move freely across sectors. Agents in the formal sector pay a fraction of income as taxes while agents in the SE pay a portion of income as penalties for being illegal and therefore have limited access to public services. These public services are financed by taxes and are affected by the quality of government institutions. Within this framework, equilibrium is achieved when the returns of the formal and SE equate. Bearing in mind these assumptions, the model predicts that the size of the SE harms economic growth.

Another study that adapts the endogenous growth framework is Sarte (1997). The effect of the rent-seeking behaviour of bureaucrats on economic growth was examined. Romer (1990) emphasised how congestion in enforcing property rights, bureaucratic regulations, and taxation limited entry into the formal sector. These factors constitute reasons that force marginal firms to move into the SE, even if they face a high cost of informality. This leads to a lower rate of growth of the economy.

Matters arising from the review of the theoretical literature

The literature shows the relevance of the endogenous growth theory to achieving the objectives of this study. In as much as this study agrees with the fact that in Nigeria, institutions are weak and agents move across sectors and pay the costs of operating in the chosen sector. It is imperative to add that both agents have to bribe the bureaucrats. In addition, public services are also financed by oil rents apart from taxes. It is also necessary to relax the assumption of constant returns to capital if both sectors are not to be seen as only survivalist. This is because agents in both sectors make returns that depend on their capability.

2.6.6 Determinants of the shadow economy

Several factors motivate agents to participate in the SE. Frey and Weck (1983), asserted that the determinants of SE need to be identified to define the factors that encourage people to take part in SE operations. Theoretically, tax payments and social security contributions, the burden of regulations are primary determinants of the SE (Medina and Schneider, 2018). Contributions to tax and social security are positively related to the SE and are measured using direct and indirect tax as a percentage of total taxes, the size of government, and the fiscal burden. Regulations have a positive relationship with the SE. Regulations include labour market regulation, barriers to trade, and restrictions on the labour market for immigrants. Regulations are measured by business freedom, economic freedom, and regulatory quality.

The growth of the SE leads to reduced revenues and quality of publicly provided goods. This raises the tax rates and results in an increased incentive to participate in SE activities. In a booming official economy, there are opportunities, but in the event of a recession, persons are pushed into participating in shadow economy activities to pay off their income losses. This event is preceded by stagnation, unemployment and depreciation of capital (Gerxhani, 2004).

Schneider and Enste (2000) regard regulations as the number of legislation and requirements. It is suggested that the number of laws be reduced. However, enforcement is more important than regulations in reducing the magnitude of the SE. Countries with comparatively fewer laws, which are well defined and established are characterised by smaller shadow economies (Johnson, Kaufmann, and Zoido-Labaton, 1998; Schneider and Enste, 2002). Schneider, Buehn, and Montenegro (2010) suggest that the main driving forces behind a growing shadow economy are an increase in actual and perceived tax burden and social security contributions, weak governance, rising restrictions and the extent of economic control. Other forces include the economic framework, poverty, open borders, institutional strength, and state of development of the financial sector.

Friedman, Johnson, Kaufman, and Ziodo-Lobaton (2000), highlights two strands of thinking on the determinants of SE. It includes high tax school and weak institution school. The former blames high tax rates for the growth of the SE. Firms like to retain all profits, so, if the tax rates are high, they move into the shadow economy. The latter holds that unregistered economic activities rise when the institutions that govern economic

activities are weak. The characteristics of weak institutions are corruption, bureaucracy, and weak legal environments, all of which drive firms underground. This suggests that a causal link exists between weak economic institutions, reduced tax revenue, and a large shadow economy.

Gerxhani (2004) in a survey of the literature identified the primary reasons for participation in the SE as follows; evading taxes, circumventing laws and regulatory requirements, reaction to labour unions by firms and workers, and the effect of international rivalry. The motive for involvement may be economic or non-economic in a broader sense (Gerxhani, 2004). Identified economic reasons include joblessness, the rigid official labour market, the declining real capital price, and high production costs. The non-economic reasons included the need for greater flexibility, greater satisfaction at work, complete use of professional qualifications and increased leisure hours. The non-economic reasons, on the other side, included the need for higher flexibility, greater job satisfaction, and full use of professional qualifications.

Renooy (1990) who argued from the behavioural economics point of view, shows that two factors, namely; the structural and opportunity factors, account for participation in the SE. The structural factors that drive persons and firms to participate in shadow economic activities consist of financial and socio-psychological stress and institutional restrictions. Institutional constraints could result from legitimate exclusion based on the size of the firm (Collins-Sowah, Kuwornu and Tsegai, 2013). The opportunity factors include individual background and non-individual components (such as environment, culture, values, and geographical features). Frey and Weck (1983) looked at the push incentives as comprising changes in relative costs and benefits. These include the increased cost of working in the formal economy because of higher tax and social security contributions and regulations of government. Lower costs are due to increased leisure time and a higher rate of unemployment while the increased cost of participating in the SE is due to the expected punishment imposed by the government.

Obayelu and Uffort (2007) identified a connection between the rate of poverty and the magnitude of the SE. The relationship is due to a high rate of unemployment and corruption rates. Other determinants, as outlined by Lemieux (2007), include multiple taxes and the prohibition of certain goods and services, propensity to barter to circumvent certain constraints, taxes, and regulations serving as impediments to exchange. All these

reasons together increase transaction costs, thereby making the shadow economy an attractive alternative. Other determinants identified by Romero (2010) are inequality in wealth, high start-up costs, and imperfect credit markets. Specifically, for developing countries, motives for participating in the shadow economy are low industrialisation and productivity rates surplus labour (Gerxhani, 2004). In this regard, the SE is a sector for survival.

2.6.7 Indicators of the shadow economy

The shadow economy cannot be observed directly except through its effects and indicators. The principal indicators identified in the literature include monetary, labour market, and formal economy indicators (Buehn and Schneider, 2009).

i. **Monetary indicators:** Buehn and Schneider (2009) stated that to avoid leaving traces, persons engaged in shadow economy activities use cash. This helps to protect all those involved in such activities. This is represented by currency outside banks divided by currency outside banks plus deposits.
ii. **Labour market indicators:** Is measured by the labour force participation rate as a percentage of the economically active population. It is also captured by
iii. the rate of increase of the labour force comprising persons aged 15 years and above.
iv. **State of the official economy:** Is measured by per capita GDP and per capita GDP growth rate. Buehn and Schneider (2009), noted that the larger the SE, the lower the GDP growth rate.

Others that are region-specific[5] include the rate of tax evasion and the proportion of the non-agricultural workforce not contributing to social protection (Loayza, 1997).

2.6.8 Effects of the shadow economy

The effects of the SE are inconsistent (Schneider and Enste, 2000). This is because it varies based on the circumstances within an economy. Schneider, Buehn and Montenegro (2010), discussed the effects of the SE from the view of its effects on the formal economy, labour market participation, economic growth, and services provided by the public sector. With the effects on the official economy, output reduces as labour moves out of the official economy, depressing the rate of growth. On the positive side,

[5]Relevant to Latin America

approximately two-thirds of the incomes earned in the SE are quickly spent in the formal economy. Schneider, Buehn, and Montenegro (2010), argued that when the formal economy is depressed, people move out of the formal economy to supplement their income.

Transactions in the SE can affect the capacity of the government to make goods and services available to its citizens (Loayza, 1997). If the government responds by increasing the tax rates and there is an observed decline in the quality of public expenditure, it will motivate the movement into the shadow economy, thereby perpetuating the cycle (Schneider, Buehn and Montenegro, 2010). The authors also argue that people who receive generous unemployment benefits are not motivated to work in the official economy.

Two strands of literature exist on the effects of SE on economic growth. One school views the SE as depressing the growth of GDP. It does so by suppressing the productivity of the labour market and limiting access of operators in the SE to basic services provided by the government (Loayza, 1997; Batini *et al.*, 2009). Shrinking the SE, therefore, raises tax revenues and stimulate an increase in public expenditure that leads to overall economic growth. Conversely, the SE is more competitive, wealth-creating and efficient. Therefore, a rise in the size of SE will boost economic growth by increasing opportunities for the poor (George, 1994). The effects of the SE are addressed in terms of its costs and benefits in Table 2.10.

Table 2.10: Costs and benefits of being in the shadow economy

Costs	Benefits
i. The low costs of generating public policies. ii. Resource costs and other costs of repression (police time, courts, costs and time to avoid detection, prosecution and conviction, utility lost by punished participants and harm to third parties). iii. Lower productivity cost (which favours smaller firms for their ability to evade taxes, which crowds out bigger and efficient firms). iv. Rent-seeking costs. v. Violence costs (where participants cannot rely on the justice system to protect them and their property rights). vi. Quality costs (lower competition and transparency bring about lower quality standards). vii. Misallocation of productive entrepreneurship. viii. Social capital costs ix. Distortion of economic data	i. Neutralisation of inefficient public policies. ii. Built-in protection against the uncontrolled growth of the state.

Source: Lemieux (2007)

Other benefits identified by George (1994), include wealth creation, resource allocation and increase in economic opportunities for the poor, maximisation of liberty, respect for personal autonomy. The disadvantages identified by Batini *et al.* (2009) include inferior working conditions, social insecurity, lower productivity, unfair business practices, lack of respect and erosion of public institutions.

2.7 Review of methodological literature

2.7.1 Measures of the shadow economy

There are three major measures for evaluating the SE. It comprises the direct, indirect, and model measures (Thomas, 1999; Frey and Schneider, 2000; OECD, 2002; Brambila-Macias and Guido, 2010; Medina, Jonelis and Cangul, 2017).

1. The direct approach involves surveys and tax audits. The survey includes observing and gathering direct information about undeclared income from selected persons and firms. A weakness with this approach is that the sample may not be random, and therefore yield biased estimates. In addition, the outcomes are sensitive to the questions posed and the willingness of the respondents. Tax audits reflect the proportion of income, which the tax authorities discover, and it is limited in scope. A significant benefit of this approach is the information it offers on the microstructure of the SE.

2. The indirect approach often called the indicator approach, makes use of macroeconomic data. It determines the magnitude of the SE through the measurement of traces left in government data. It is based on the following facts: that those working in the shadow economy spends more than their documented returns and a decline in the official participation compared with other countries indicates an increase in unofficial work. The indirect approach is also connected with the usage of physical inputs such as electricity and the monetary approach. The monetary approach is popular because the amount of currency is well documented. The indirect approaches are explained as follows;

a. Discrepancy methods are observed from two angles, namely; discrepancies in national expenditure and income data, and, official and actual workforce. The difference between the expenditures and income arises from the decision of SE agents to under-declare their income for tax purposes. However, their expenditures are not hidden. This difference represents the magnitude of the SE. In addition, the discrepancy associated with the actual and official workforce is based on the assumption that the labour force participation rate

is constant. Therefore, a decline in the size of the official workforce may show a rise in the increase of the SE. This method is weak because it depends on the accuracy of estimates of income and expenditure. In addition, labour statistics may not imply a rise in SE, but it may imply a severe economic problem.

b. Monetary methods, which comprise the transactions and currency demand approach, evaluate the magnitude of the SE. This method was developed by Cagan (1958) and subsequently by Guttman (1977). Feige (1979) transformed it into the transaction approach, while Tanzi (1980, 1983) carried out the econometric application. Gutmann's (1977) approach was based on the following:

(i) Taxes and regulations are the leading drivers of the SE.
(ii) Cash is used to conduct SE transactions to leave no trace for authorities.
(iii) Changes in taxes and regulations influence the proportion of currency to demand deposits.
(iv) There is a period in which there is no presence of SE.
(v) The income-velocity of currency in circulation is equal for both the formal and shadow economy. Rises in the currency ratio are related to the additional currency used in the SE. Therefore, the size of the hidden sector is velocity times the extra currency.

An increase in SE activities raises the demand for the currency. A currency demand model is estimated to separate the effects of excessive demand for currency. Variables such as economic development, payment habits of the public, and rates of interest are controlled for, while variables such as the tax burden, regulations of government and the complexity of the tax system are included in the model. Tanzi (1983) argues that the velocity relies not only on factors that induce hidden transactions but also on income and the opportunity cost of holding cash. Another criticism is that cash is not used to pay for all transactions in the SE. Some transactions are conducted using the barter system. In addition, not all operations are compensated for in money in the shadow economy. The assumption of the non-existence of the SE in a base year is not very practical. Ahumada and Alvaredo (2006), show that the assumption of the same velocity in both economies is feasible if the elasticity of income is equal to one.

The original model specified by Cagan (1958) is as follows;

$$C_0 = A(1+\Theta)^{\alpha} Y_0^{\beta} \exp(-\gamma_i) \qquad (2.5)$$

C_0 is observed money balances while Θ captures the critical variables that motivates economic agents to hide transactions. Θ is typically measured using government consumption to GDP, tax rates and tax revenues to GDP. Y_0, α, β, γ and A are parameters respectively.

c. Physical input method in which electricity is the primary variable. There are two main methods, namely the Kaufmann–Kaliberda method and the Lackó method. Kaufmann and Kaliberda (1996) assert that a physical measure of economic activity is electricity consumption. Critics of this approach argue from the standpoint that not all SE activities use electricity, besides other sources of energy can be used. Second, technical progress allows for efficient use of electricity. Third, it is restricted in application across countries since the elasticity of electricity/GDP ratios differs across countries.

Lackó (1996) assumed that some aspects of the SE, especially household production, are connected with the usage of electricity. It was presumed that there existed a positive relationship between the consumption of electricity by the household and the SE. This method has its weaknesses, as electricity is not the only source of energy. Second, SE activities are not exclusive to the household sector. Third, some variables used such as the expenditure on social welfare, and the base value of the SE may not be applicable or yield reliable results in developing countries.

3. The model approach focuses on those factors that stimulate participation in the SE. This approach is associated with the Multiple Indicators Multiple Causes (MIMIC) model, which is a unique Structural Equation Model (SEM). All other previously mentioned methods only describe one indicator and use it to capture the effects of the SE. In reality, effects of the SE appear concurrently in the product, labour and money markets (Schneider, 2014). Unlike other methods that consider only one cause, for instance, tax, several causes can be evaluated in the context of the MIMIC model. This approach examines the interaction of an unobserved parameter with a set of observed variables. It is a popular econometric model that has been used by Loazya (1997), Brambila-Macias and Guido (2010), Hassan and Schneider (2016) and Medina, Jonelis and Cangul (2017). Joreskog and Goldberger (1975) pioneered the technique, while, Frey and Weck-Hannemann (1984) developed the application of MIMIC modelling to the shadow economy. The model poses several advantages to the study of the shadow economy.

Brambila-Macias and Guido (2010) identified the following advantages. First, it relies on a variety of variables and second; it is not constrained by lack of information.

A popular method used for estimating the MIMIC model is the maximum likelihood (ML) function. According to Hassan and Schneider (2016), four assumptions must be satisfied before estimating the MIMIC model. They are:

i. The variables must be jointly and normally distributed.
ii. The variables should be linearly related.
iii. The distributions of the residuals must be homoscedastic
iv. The sample size must be reasonably large. Hassan and Schneider (2016) suggest that it must not be less than 50. However, Brambila-Macias and Guido (2010) proposed that 35 observations per variable are adequate.

The ML function is used by applying the iterative process to derive the estimates that minimise the fitting function. The MIMIC model consists of two parts, namely the structural and measurement equations.

The model for the structural equation is given as;

$$\eta = \gamma' x + \varsigma \tag{2.6}$$

Where $x = (x_1, x_2, ..., x_q)$ is a $(1xq)$ vector that represents observable causes of the latent variable η and $\gamma = (\gamma_1, \gamma_2, ..., \gamma_q)$ is a $(1xq)$ vector of coefficients that describe the shadow economy's relationship with its causes. ς represents the structural disturbance term.

The measurement model representing the relationship between the latent variable (the shadow economy) and its observable indicators are presented as;

$$y = \lambda\eta + \varepsilon, \tag{2.7}$$

Where $y = (y_1, y_2, ..., y_p)$ is a $(1xp)$ vector of indicator variables, the vector of the regression coefficients is λ and ε is a $(1xp)$ vector representing the measurement error term.

Equation (2.6) is substituted into equation (2.7) to obtain

$$y = \lambda(\gamma' x + \varsigma) + \varepsilon \tag{2.8}$$

Expanding equation (2.8) and defining $\Pi = \lambda\gamma'$ as a matrix with rank equal to one and $z = \lambda\varsigma + \varepsilon$, it is rewritten to obtain the reduced multivariate regression form of the MIMIC model;

$$y = \Pi' x + z \tag{2.9}$$

The error term in equation (2.9) is a vector of linear combinations of the error terms of the structural equation and the measurement model, respectively. The identification and estimation of the MIMIC model require that one of the indicator variables is fixed based on economic theory (Bollen, 1989). For instance, the real GDP growth is constrained to take a value of minus one, while, currency in circulation takes a value of +1 (Schneider et al., 2010). This is not binding as various authors choose the variable arbitrarily. It is only possible to constrain one indicator variable at a time, while the other(s) are unconstrained. The shortcomings of the MIMIC model, as summarised by Schneider and Enste (2000) includes generation of relative coefficients, high sensitivity to changes in data and specification, difficulty as to the selection of causes and indicators and impact of benchmarking/calibration procedures on results. The strength and weaknesses of the approaches are summarised in Table 2.11.

Table 2.11: Measures of the shadow economy

Method	Features	Weaknesses
	DIRECT APPROACHES	
Surveys and tax audits Surveys of taxation compliances	Uses surveys to get data, estimate the size of the SE from an audit of unreported taxable income.	The unwillingness of respondents to disclose the extent of involvement in SE activities
	INDIRECT APPROACHES	
National income accounting statistics	SE workers can hide their income, but not expenditures (Thomas, 1999). Inconsistency between national income and national expenditure. No formal modelling.	Subjectivity, the narrowness of coverage, emphasis on GDP rather than the tax base
Labour approach Labour force statistics	Measured as a drop in labour participation in the official economy. It is based on the assumption of the constant participation rate.	Narrow focus, the likelihood of changes caused by other economic and socio-demographic factors such as an ageing population and illegal migrants.
Monetary approaches Currency ratio by Cagan (1958) Variations by Tanzi (1983) and Bhattacharyya (1990)	All unreported transactions are captured by cash. A constant ratio of cash to demand deposits. Same income velocities in both the official economy and SE.	The results are sensitive to data definitions, basis weakened by electronic banking operations.
Monetary transactions Feige (1979)	Similar to other earlier explained monetary approaches.	Requires a great deal of data
Physical inputs (Electricity consumption) Lackó (1996) and Kaufmann and Kaliberda (1996)	Estimates the growth of the SE from electricity usage. Subtracts official GDP growth rate from the overall electricity usage growth rate and assigns the variance to the growth of the SE.	Does not capture activities that make little or no use of electricity or exogenous changes in electricity use. For instance, electricity supply in Nigeria is characterised by interruptions and has been available mostly in urban areas.
Model approach Latent variable structural models/ Multiple Indicators, Multiple Causes (MIMIC) model Frey and Weck (1984)	Treats size of SE as an unobservable variable linked to identified causal variables of SE. Allows for several explanatory variables and indicators of the shadow economy. Results in the form of an index, which shows the trend, but not the magnitude of the SE. Supplemented by monetary methods for base-year estimates.	Suffers from risks associated with non-stationarity, specification and units of measurement. Lacks a theoretical basis for the link between the indicators and causal variables except for the unobserved variable linking both up.

Source: Author's Compilation from Giles (1999), Lemieux (2007), Ferwerda, Deleanu and Unger (2010)

2.7.2 Review of estimation techniques and variables used

Various techniques have been applied to estimating the determinants and size of the shadow economy. They include the MIMIC model (Brambila-Macias and Guido, 2010; Loayza, 1997; Hassan and Schneider, 2016; Medina, Jonelis and Cangul, 2017; Schneider and Enste, 2000), dynamic MIMIC model (Buehn and Schneider, 2009), descriptive statistics (Akerele, 1997; Fapohunda, 1985; Omisakin, 1999; Oni, 1994, 2006), the probit model and logit model (Angel-Urdinabe and Tanabe, 2012; Schneider, Sookram and Watson, 2006; Sookram and Watson, 2008).

Henley, Arabsheibani and Caneiro (2006) utilised the probit regression, and the variables of interest were age, age squared, female, ethnicity, illiterate, schooling, region, urban resident, union member, an establishment with less than eleven employees, occupation and other family circumstances. Schneider, Sookram and Watson (2006), analysed data collected from a cross-sectional field survey using multinomial logit and ordered probit models.

Angel-Urdinabe and Tanabe (2012) examined variables of interest such as age, gender, education, marital status, employment sector and status, and urban dummy using probit regression. The data were obtained from household surveys and labour market surveys of the various countries of interest. Collins, Muhammad, and Alvaro (2015) carried out a survey of 300 microenterprises. Some of the determinants studied include gender, age, education, income, firm sector, business premises, firm's age, business size, source of financing, exclusion drivers, entrepreneurial attitudes, high taxes, burdensome regulations, corruption, and tax morality. The study used a logistic regression analysis.

Bhattacharyya (1990) estimated a variant of the currency demand approach, which excluded the tax variable. The variables of interest were the currency in circulation, income, rate of interest, consumer price index, and a dummy for the 1973 oil shock. The inclusion of variables such as financial innovations by Faal (2003) and educational attainment and population residing in the urban areas by Ariyo and William (2011) in currency demand models were carried out to take into consideration, current events in the financial market.

Bose, Capasso and Wurm (2008) in their study controlled for variables already identified as determinants of the underground economy and paid attention to initial

conditions. An index of banking depth was constructed using the annual average of credit to the private sector, total domestic credit, and M3 as a percentage of GDP. The index of inefficiency was the annual average of the net interest margin, lending-deposit rate spread, and value of central bank assets as a proportion of central and private bank assets. A composite index of banking development was obtained by taking an average score of the indices mentioned above. Other variables included economic development, the degree of openness, proxies for developments in the financial sector, policy, institutions, and regulations.

Brambila-Macias and Guido (2010) used annual time series data to estimate the growth of the informal economy in Mexico. The variables of interest were the burden of tax, level of salary, inflation, rate of unemployment, and regulation. The estimation technique adopted was the structural equation model.

Torgler and Schneider (2007) measured the SE as a percentage of the GDP using the Dynamic Multiple Indicators Multiple Causes (DYMIMIC) model. Variables of interest included the population size, labour force, marginal tax rate as a proxy for fiscal burden, price controls, labour market regulations, indicators for government and institutions, and share of agriculture and urban population in GDP.

Medina, Jonelis and Cangul (2017) and Medina and Schneider (2018) deviated from other MIMIC related works by using the predictive mean matching method to estimate the size of SE. Drivers of the SE included tax burden, institutions, unemployment and trade openness, while, the indicators were currency as the ratio of broad money, workforce participation, and night-lights.

Loayza (1997)'s study was targeted at Latin American countries. The dependent variable used was economic growth, which was represented by growth in per capita GDP. The size of SE (percentage of GDP) was obtained from the results of the MIMIC model estimated in the study. The growth regression included a set of control variables that included the initial level of per capita real, the initial rate of secondary school enrolment, average tariffs on goods, average inflation rate, and the provision of public services proxied by an index of public infrastructure. Afuroglu and Elgin (2015) used the endogenous growth model in which the SE was subject to the cash-in-advance constraint.

William (2010) utilised the endogenous growth model to evaluate the impact of tax evasion on economic growth. Similarly, Ariyo and William (2011) used the currency demand model to estimate the size of SE. Schneider and Enste (2000) estimated the size of SE using the physical input approach. While these techniques are robust, it is observed that its application is limited to a specified dimension of the SE.

2.8 Empirical literature review

The empirical outcomes on the link between the drivers of participation and the magnitude of the SE are varied (Bhattacharyya, 1990; La Porta and Shleifer, 2008; Ariyo and William, 2011; Angel-Urdinabe and Tanabe, 2012; Medina and Schneider, 2018; Wu and Schneider, 2019). In addition, the effects on the economy are mixed, as sometimes the results show a positive relationship and, sometimes, an inverse relationship. These effects are connected with the use of different variables, the economy under question and the methodology adopted.

2.8.1 An empirical review of studies conducted outside Nigeria

Micro-based studies

The micro-based studies on dimensions of the shadow economy have been examined by various authors such as Henley, Arasheibani and Caneiro (2006), Angel-Urdinabe and Tanabe (2012), and Vargas (2015). Henley, Arabsheibani and Caneiro (2006) investigated three definitions of the SE based on the employment contract, registration and social security. The results revealed that the impact of demography, education, and family circumstances on the probability of participating varied across definitions.

Schneider, Sookram and Watson (2006), investigated the socio-economic, demographic, and attitudinal traits that influenced the participation of individuals in Trinidad and Tobago in SE and their perception of the risk of being detected by the tax authorities. The results suggest that households are motivated to take on SE activities because taxes are high, incomes are low, high dependency burden, and non-detection of subsequent tax evasion.

Angel-Urdinabe and Tanabe (2012) examined the micro-determinants of SE employment. Labour informality was defined as the proportion of all employees who do not have access to social security. The outcomes of the analysis showed that the size of

the public sector and the agricultural sector were the main drivers of SE. Also, informality rates were highest among those aged 15 to 24 years. Results also show that workers in the informal sector were disadvantaged, as they were not covered against social risks because they were engaged in low paying and low productivity jobs.

Collins, Muhammed and Alvaro (2015), investigated the varying levels and determinants of informality among SE entrepreneurs in Lahore, Pakistan. The dimensions of the shadow economy examined include legal status, tax registration status, and accounting records kept. The study shows that the characteristics of the entrepreneur and the enterprise are critical determinants of SE, rather than entrepreneurial motives and the regulatory environment. The dimensions considered by Vargas (2015) are the firm size (five or fewer employees), participation in a pension fund, possession of tax identification number and the issuance of invoices/receipts. The results show that the shadow economy is concentrated among low-income workers. SE firms suffer from low productivity and negatively affect the performance of the formal sector.

Macro-based studies

The macro-based dimensions of the SE have been investigated using the currency demand, and the MIMIC model. The first attempt to estimate the size of the SE using the currency demand model was Cagan (1958). Subsequent attempts included Guttman (1977), Feige (1979), Tanzi (1980, 1983), Bajada (1999), Faal (2003) and Ariyo and William (2011). However, Cagan (1958), Guttman (1977), and Feige (1979) did not use any statistical technique to derive the estimates. The procedure proceeds with the assumption that SE transactions were carried out using cash. Therefore, an increase in the demand for currency increased its size. Cagan (1958) used the ratio of currency to the money supply in a base year with a constant velocity assumption to quantify the size of the SE. Guttman (1977) and Feige (1979) used the ratio of currency to demand deposits. Tanzi (1980, 1983) spearheaded the transition to estimating the currency demand function. The influence of the SE was represented by tax rates to show the motivation for participation in the SE. The income velocity of money in both the official and shadow economy was assumed the same, and the series generated to represent the size of the SE. While Ahumada and Alvaredo (2006) challenged the assumption of equal velocity, Bhattacharyya (1990) estimated a variant of the currency demand approach, which excluded the tax variable. Estimates from the currency demand equation are used for the

following purposes; to estimate the size of SE, to calibrate factor scores obtained in the MIMIC model, and for comparison.

Bose, Capasso and Wurm (2008), examined the impact of developments in the banking sector on the size of the SE. Results indicated that improvements in the banking sector were associated with a smaller SE. Based on the results obtained; they argued that the depth and efficiency of the banking sector were necessary for reducing the extent of the SE.

Brambila-Macias and Guido (2010) estimated the growth of the informal economy in Mexico. The results revealed the significance of the level of salaries and regulation as drivers of the informal economy. The authors also find a positive relationship between economic growth and the informal economy.

Obayelu and Uffort (2007) analysed the link between poverty and the size of the SE in both developing and advanced countries. They identified high unemployment and corruption as causing the link between poverty and the SE. In addition, Nikopour and Habibullah (2010) traced the relationship between poverty and the SE through its impact on the size of the government and economic growth. Results demonstrate that an increase in the SE gives rise to increased poverty in developing countries, while it decreases poverty in developed countries.

Torgler and Schneider (2007) analysed the influence of governance, institutional quality, and tax morale on the SE. The working hypothesis was premised on the fact that if citizens perceive that their interests were represented in the political institutions and they considered the state helpful in providing public goods, they will opt to stay in the formal economy. Their argument is based on the observation that corrupt countries have a large shadow economy. Findings showed that an increase in tax morale leads to a reduction in SE.

Medina, Jonelis and Cangul (2017) and Medina and Schneider (2018) deviated from other MIMIC related works by using the night-lights intensity approach instead of GDP per capita. This was based on the argument that GDP was used as a cause and an indicator variable. The PMM results yielded similar results to that of the MIMIC model. This implied the robustness of the MIMIC approach.

The effects of SE on economic growth are not conclusive. Wu and Schneider (2019) investigated the long-run relationship between the SE and its causes. The authors identified a U-shaped relationship between the size of SE and economic development. At a low level of development, a negative relationship existed between the size of SE and GDP per capita, but, when the size exceeded a threshold, the size of the SE rose with per capita income. Reasons were offered for the positive and negative relationship between SE and economic development. It was argued that in the absence of financial pressures, individuals might prefer working in the shadow economy when economic development was accompanied by an improvement in productivity and technology advancement. However, economic development can also help reduce the size of SE when economic development was accompanied by strong institutional capacity and better infrastructure.

Loayza (1997) investigated the determinants and effects within the context of the endogenous growth model. The production technology in the model depended on congestible public services. The study was targeted at Latin America countries, which had a tradition of regulations and weak institutions. The results revealed a negative relationship. Afuroglu and Elgin (2015) investigated the effect of inflation in the presence of informality. The results revealed that while inflation had adverse effects in the long-run, its effects were milder in the presence of a large informal sector.

2.8.2 An empirical review of works carried out on Nigeria

In Nigeria, institutions such as the National Bureau of Statistics (NBS), Central Bank of Nigeria (CBN) and the Nigeria Institute for Social and Economic Research (NISER) have carried out extensive work on the shadow economy. The emphasis has been on the socio-economic characteristics of participants and incentives for participation. Such surveys through collaboration between the three bodies include the CBN/FOS/NISER study carried out in 2001. Surveys carried out by the NBS include NBS (2009, 2010). There have also been country-specific regional studies such as Fapohunda (1985) who investigated the SE of Lagos. Meagher and Yunusa (1996) carried out studies on Zaria in Kaduna state in 1991. Farinmade (2012) identified SE activities and studied the challenge of enhancing the circumstances of SE activities in Lagos. The work examined the socio-economic characteristics of individuals engaged in such activities, the conditions under which they operated and identified the factors that encouraged participation. The study revealed the link between employment in the informal sector and

formal sector unemployment. The characteristics of the shadow economy as gathered from these studies have not changed significantly. These micro studies highlight the fact that gender, culture, economic opportunities, the overall burden of regulations and state of the labour market are critical to understanding the dynamics of the shadow economy. These studies, however, did not directly estimate the magnitude of SE, nor was the dimensions of the SE considered.

William (2010) described the trend, estimated the size and the extent of tax evasion. The study was directed at selected African countries and evaluated the impact of tax evasion on economic growth. Results from the analysis established a positive relationship between tax rate, tax evasion, and the SE for all the countries considered. A similar work by Ariyo and William (2011) carried out in Nigeria obtained similar results.

Nchor and Adamec (2015) in a cross-country analysis estimated the size of the SE of Nigeria. The size was estimated at 48 per cent in 2012, while the period preceding 2012 averaged 36 per cent. Schneider and Enste (2000) estimated the size between 1990 and 1993 as being between 68 and 76 per cent. Medina and Schneider (2018)'s estimate for Nigeria averaged 56.67 per cent over the period 1991 to 2015.

Matters arising from the review of the empirical literature

These micro studies on the SE are varied in coverage, but they fail to cover dimensions such as enterprises trying to cover up their activities (cash-based transactions and concealment) and the post-detection dimensions in terms of resulting harassment. Therefore, this research contributes to the literature by examining dimensions relating to cash-based transactions, concealment, and harassment.

More macro-based studies have been conducted in other countries than in Nigeria. Nigeria has appeared mainly in cross-country analysis with the effect that the peculiarity of the SE in Nigeria is ignored. This lacuna points to the vast knowledge that a country-specific work will generate.

CHAPTER THREE

THEORETICAL FRAMEWORK AND METHODOLOGY

3.1 Theoretical framework

The theoretical framework adopted for this study is the endogenous growth model, as postulated by Barro (1990), and Barro and Sala-I-Martin (1995). In the original endogenous model, the shadow economy was ignored. Loayza (1997) adapted the model to include the shadow economy, and it is applied to this study. Loayza's model evaluated the determinants, size of the shadow economy and its effects on economic growth, which are the objectives of this study.

Assumptions of the model

i. Agents endowed with different initial levels of capital populate the economy.
ii. The agents are rational.
iii. Capital comprises physical and human capital.
iv. There are fixed returns to scale to capital.
v. There is only one good produced, which may be consumed or invested.
vi. The economy is divided into two, namely the formal economy and the SE.
vii. There is free mobility between the sectors.
viii. The rate of return on capital depends on the quantity of public services relative to production.

The decision to take part in SE is based on the assumption of rationality. The choice to participate partially or entirely depends on the expected costs and benefits. The economic unit considers the twin costs of formality that include the cost of accessing and remaining in the formal sector (De Soto, 1989). The costs of assessing the formal sector include the offering of bribes, time, and cost to complete the registration process. The cost of remaining in the formal sector includes tax payments, regulations, and bureaucratic requirements. Taxes are a significant source of government. Countries that have weak tax authority monitoring activities of individuals and SE firms have more

burdensome tax burdens due to the small number of formal firms (Loayza, 1997). Regulations manifest in the form of minimum wages, fringe benefits, social security, constraints on hiring and dismissal, and union protection. However, the most restrictive and costly is the worker's welfare. Where regulations are many, being in the shadow economy reduces these costs substantially. For instance, the formal sector sometimes supplements a deliberately small formal workforce with a large pool of shadow economy workers to reduce costs. The bureaucratic requirements of remaining formal are significant due to the time and effort in fulfilling those requirements by the firms concerned.

There are costs of being in the shadow economy. The first is the penalties paid when caught. These penalties are usually stiff and may involve the culprit giving up a substantial amount. Sometimes, the penalty can be circumvented by paying a bribe. This is a reason firms operating in the shadow economy operate on a small scale to avoid detection and reduce the amount to be paid as penalties and bribes. Second is the failure to benefit fully from public services provided by the government.[6] The implications are that the operators cannot exercise full property rights, creating uncertainty that increases transaction and monitoring costs. Another dimension is higher borrowing rates, the low capital value, and difficulty in transferring property and transformation into formal firms. These costs give shadow economy firms their characteristics, namely labour intensiveness and the smallness of their operations. Higher costs, therefore, may motivate the firm to become formal or constrain its size.

The model

Based on the assumptions earlier stated, the basic production model is stated as;

$$Y_i = A\left(\frac{G}{Y}\right)^{\alpha} k_i \qquad 0 < \alpha < 1 \qquad (3.1)$$

Yi and k_i denote production and capital owned by the agent, *A* is an exogenous productivity parameter; G represents the flow of public services, Y is total production in the economy and α is the elasticity concerning $\frac{G}{Y}$.

[6] They include the police, legal and judicial system.

The agent may belong to either the formal or the shadow economy. Agents in the formal sector pay taxes proportional to their income. The tax revenue generates funds for the provision of public services and the enforcement system. SE agents pay a proportion of their earnings as penalties. The proceeds earned from imposing penalties can finance the enforcement system. However, the agents in the shadow economy have limited access to public services because of their status. Therefore, the net income of both agents is;

$$y_i^F = (1-\tau)A\left(\frac{G}{Y}\right)^{\alpha} k_i\,, \qquad 0 < \tau < 1 \tag{3.2a}$$

$$y_i^S = (1-\pi)A\left(\frac{\delta G}{Y}\right)^{\alpha} k_i\,, \qquad 0 < \pi < 1 \tag{3.2b}$$

Where τ is the tax rate, π is the penalty rate, δ is the proportion of public services available to SE agents, while the superscripts *F* and *S* denote formal and shadow economy status, respectively. The size of the shadow economy is equivalent to the ratio of production in the SE (Y^S) to the official economy (*Y*);

$$S \equiv \frac{Y^S}{Y} \tag{3.3}$$

Taxes finance the provision of public services following the rule;

$$G = \eta(q,\lambda)(\tau Y^F), \qquad \text{where } 0 < \eta(.) \leq 1 \tag{3.4a}$$

$$\frac{\partial \eta}{\delta q} > 0, \qquad \frac{\partial \eta}{\delta \lambda} < 0, \tag{3.4b}$$

$\eta(.)$ is the portion of tax revenue available for the provision of public services. Equation 3.4b implies that tax revenues available for the provision of public services η is an increasing function of the quality of institutions q. Second, η is a negative function of the enforcement strength λ.

The proportion of public services to total production that determines the capital rate of return is stated as follows;

$$\frac{G}{Y} = \eta(q,\lambda)(\tau(1-S)) \tag{3.5}$$

Given the tax revenue $\eta(.)$ and tax rate τ, a rise in the magnitude of the shadow economy, *S*, lowers capital efficiency and congests public services. This creates a public dissatisfaction, which alongside the strength of the enforcement authorities determines the penalty rate, which is given as;

$$\pi = \pi(\lambda, S), \qquad 0 < \lambda \leq 1 \tag{3.6a}$$

$$\frac{\partial \pi}{\delta \lambda} > 0, \qquad \frac{\partial \pi}{\delta S} > 0, \tag{3.6b}$$

The penalty rate is a positive function of the strength of the enforcement system λ and the size of the SE. The relative size of the SE is obtained from equations (3.2a and 3.2b) and (3.6)[7]. It is given as;

$$1 - \pi(\lambda, S))\delta^{\alpha} = (1 - \tau) \tag{3. 7}$$

Equation (3.7) is solved for *S* to obtain;

$$S = \frac{\delta^{\alpha} + \tau - 1}{\lambda \delta^{\alpha}} \tag{3.8}$$

$$\Rightarrow S = S(\bar{\lambda}, \overset{+}{\tau}, \overset{+}{\delta}, \bar{\alpha})$$

The signs above the parameters suggest that a rise in the tax rate and the fraction of public services available to the shadow economy leads to a larger size of the SE. An increase in enforcement strength and productivity in public services cause a decline in size.

Given the value of the SE, the economy's rate of return on capital r is,

$$r = \left[A(1-\tau)\tau^{\alpha} \right] \left[\eta(\bar{\lambda}, \overset{+}{q}) \left[1 - S\left(\bar{\lambda}, \overset{+}{\tau}, \overset{+}{\delta}, \bar{\alpha} \right) \right] \right]^{\alpha} \tag{3.9}$$

The first set of brackets refers to the period when the shadow economy is absent. The rate of return is first increasing and subsequently decreasing and suggests the negative effect of the shadow economy on the rate of return on capital.

To derive the economy's growth rate, economic agents are assumed to maximise utility subject to their budget constraints;

$$Max \qquad U = \int_0^{\infty} \frac{c_i^{1-\theta}(t) - 1}{1-\theta} e^{-\rho t} dt$$

Subject to $\quad \dot{k}_i(t) = y_i(t) - c_i(t)$

$$= rk_i(t) - c_i(t) \tag{3.10}$$

Where the constant rate of time preference is denoted by ρ. The rate of consumption growth is derived by taking the first order and transversality condition;

[7]Equate y_i^F and y_i^S together, insert in equation (3.6) and solve for S

$$\frac{\dot{c_i}(t)}{c_i(t)} = \gamma = \frac{1}{\theta}(r - \rho) \tag{3.11}$$

It is further assumed that K, Y, Y^F and Y^S is fixed and is equal to the consumption growth rate, γ. The long-run growth of the economy depends; therefore, on technology, preference and policy parameters. From equations (3.9) and (3.11), the following expression for the growth rate of the economy is obtained;

$$\gamma = \frac{1}{\theta}\left[\left[A(1-\tau\right]\tau^{\alpha}\right]\eta\left(\overset{-}{\lambda},\overset{+}{q}\right)\left[1 - S\left(\overset{-}{\lambda},\overset{+}{\tau},\overset{+}{\delta},\overset{-}{\alpha}\right)\right]^{\alpha} - \rho \tag{3.12}$$

This expression shows that economic growth is a positive function of the quality of government institutions, tax rate, and a fraction of public services. As the quality of government institutions improves and a less costly enforcement system evolves, the growth rate rises because a larger share of tax revenues is set aside to finance public services. There is less congestion of public services, which, together in combination with other parameters, boosts economic growth.

Predictions of the model

i. Economic growth slows down, where there is a significant burden of taxes, and the system of enforcement is weak.
ii. The size of the shadow economy is inversely related to economic growth.
iii. Policies that increase the relative size of the SE generate a decline in economic growth.
iv. The SE is negatively correlated with public services.

3.2 Methodology for the survey approach

3.2.1 Survey sample area

The objectives that will be realised from the survey approach includes examining the factors that determine various dimensions of the SE, its size and effects on the economy. To achieve the objectives of this research from a micro point of view, a survey was carried out in two states of the Federation, namely; Lagos and Kano. This survey may not rival standard surveys carried out in Nigeria in terms of national coverage, but it is more specific in the dimensions and drivers of the shadow economy. Both states have the largest number of shadow economy participants and enterprises.

Kano state is situated in the North-West region of Nigeria and covers an area of 20,760 square kilometres. It was created in 1967. According to the 2006 population census, Kano state had a population of 9,401,288 persons with 1,590,669 owners of SE business (NBS, 2010). It shares boundaries with Katsina, Jigawa, Bauchi, and Kaduna states. There are forty-four (44) local government areas in the state. Kano City is the state capital and is Nigeria's third-largest metropolis with a population of approximately three million. The city is made up of nine local government areas out of which five constitute our sample area, namely Gwale, Dala, Tarauni, Fagge and Kumbotso. Historically, Kano state has been known for commerce and agriculture and for being a significant route for sub-Saharan trade, production of groundnuts, manufacturing and solid mineral deposits. The dominant ethnic groups in Kano are the Fulanis and the Hausas. However, it attracts other ethnic groups from across the country besides having a small percentage of foreigners.

Lagos state has a population of 9,111,605 million persons making her rank as one of the top two most populous states in the Federation. Incidentally, it has one of the highest participants disaggregated by owners (837,919) in shadow economy activities (NBS, 2010). Lagos state is situated in the South-West region of the country, and, it shares a common boundary with Ogun state besides having a long coastline with the Atlantic Ocean. For administrative purposes, Lagos state has twenty Local Government Areas (LGAs). Like Kano state, it was created in May 1967 with its capital designated as Ikeja. Before its creation, the Federal government administered Lagos. It is the most economically significant state with the largest urban area in the country. Pull factors for the enormous economic activities in Lagos as put forward by Farinmade (2012) includes easy access to Lagos Island[8], nearness to the seaport and significant presence of the formal sector. The dominant ethnic group in Lagos is Yoruba. However, it also attracts other ethnic groups from across the country in addition to also having a small percentage of foreigners.

3.2.2 Sampling technique

The purposive sampling technique was used to select two hundred and six (206) and two hundred and four (204) owners of microenterprises in Lagos and Kano states,

[8]In the aftermath of the state creation, the Island became a beehive of both administrative and economic activities and that is retained even to present time.

respectively. Purposive sampling is a type of nonprobability technique that uses expert knowledge to select a sample that is representative of the population (Lavrakas, 2008). The researcher decides on the information to be obtained and deliberately selects willing respondents (Lewis and Sheppard, 2006). The technique provides reliable and robust information and is more efficient than random sampling (Bernard, 2002).

For this study, the operational definition of the SE originates from the characteristics of its operations. Therefore, a shadow economy participant is an entrepreneur who operates on a small basis and possesses few resources (capital), whose business is not formally registered, and does not take part in the official tax system, and the pension system. Furthermore, the participants do not have a bank account separate from the personal account of the owner.

The sample states were selected because they constituted the states with the highest incidence of shadow economy activities. Incidentally, the two have the highest population in the country. Thereafter, clusters of business in the metropolis spanning several local government areas were selected, and respondents were interviewed or administered questionnaires based on which was convenient for them. The local government areas surveyed in Kano include Tarauni, Fagge, Kano Municipal, Gwale, Kumbotso and Dala. Lagos was divided into five-axis for easy administration. They are as follows; Apapa/Badagry axis, Oshodi axis, Iyana-Ipaja axis, Ogudu/Berger/Ikeja axis and Yaba/Obalende axis.

3.2.3 Survey design and instrument

The sample for this study was selected from clusters of microenterprises within selected LGAs, in the states. A structured interview questionnaire was adopted for easy administration, while, noting the educational status and briskness in the response of those to be surveyed[9]. In addition, interviews were conducted to minimise the number of respondents who give false responses to sensitive questions. A manual that explained in details how the questionnaire was to be filled accompanied the questionnaire and served as reference material for field staff.

[9]It was perceived from the pilot study conducted by the author that some of the respondents were not literate, and were not patient enough to fill the questionnaires. For this category of persons, the interview method was used.

The questionnaire was divided into five (5) sections. Information was collected on demographics and business characteristics, reasons for participation, size and perceived effects of activities. In addition, some basic information was collected as regards tax morale, hours spent on the activities that add to the production of goods and services during the reference period, harassment, and credit history. The SE was measured by incomplete records keeping, cash-based transactions, non-registration, concealment of activities from official scrutiny, and harassment by public enforcement agents. This questionnaire was adapted to reflect the local incentives that encourage individuals to partake in the SE.

The criterion for the selection of respondents in the sample was the condition that they were microenterprise owners employing less than ten workers.[10] The criterion was important because they made up most of the participants in the informal sector and could provide information about the operations of the enterprise. The sectors of activities selected were wholesale and retail trade, manufacturing, transportation, storage, accommodation, and food services, which were identified as the dominant sectors of this group of entrepreneurs (NBS, 2009).

The fieldwork was carried out for this study in 2014 between May and June in Lagos state and September and November in Kano State, respectively. Before the fieldwork, a survey pilot study was carried out by interacting with informal sector experts, especially from the Nigeria Institute of Economic and Social Research (NISER), conducting focus interviews, and pretesting the questionnaire with selected shadow economy participants. Feedback from the pilot survey necessitated several corrections on the questionnaire before the final administration.

Two hundred and fifty (250) questionnaires were distributed in each state, out of which two hundred and six (206) and two hundred and four (204) were retrieved in Lagos and Kano states, respectively. Four hundred and ten (410) questionnaires were retrieved out of five hundred questionnaires distributed in both states representing a response rate of eighty-two (82) per cent, which is reasonably high.

[10]Commonly referred to as microenterprises.

3.2.4 Reliability and Validity Measurement

Bollen (1989) defines reliability as the measurement of consistency. It is referred to as stability of measurement over a range of conditions in which the same outcomes are achieved (Nunnally, 1978). According to Drost (2011), the reliability of a measurement instrument is limited by errors introduced by variation in the test, factors affecting the behaviour of subjects and approach adopted.

Typical methods used for estimating test reliability include test-retest reliability, alternative forms, spit-halves, inter-rate reliability and internal consistency. Cronbach (1951) popularised the internal consistency method using Cronbach's alpha. It tests how well a collection of items measure a specific behaviour in the test experiment. To ensure consistent testing, estimates are based on average inter-correlations between all the individual items in a test. Nunnally (1978) suggests that reliabilities of 0.70 or higher are sufficient.[11]

Validity is concerned with the significance of components of research (Drost, 2011). Drost (2011) identified four validity types, namely; statistical conclusion validity, internal validity, construct validity, and external validity.[12] Statistical conclusion validity ascertains whether there is a relationship existing between the variables, while, internal validity clarifies that a causal relationship exists. Construct validity views the particular cause-and-effect behaviour of the variables under consideration. It refers to how well the subject under investigation is translated into reality. To substantiate construct validity, there is a need to gather information from face to face, content, concurrent, predictive, convergent, and discriminant validity (Campbell and Fiske, 1951; Drost, 2011). External validity is associated with the possibility of generalising the research outcomes (Cook and Campbell, 1979; Drost, 2011).

3.2.5 Specification of the shadow economy participation model

Objective 1: Micro-based incentives for involvement in the shadow economy

The literature review in chapter two provides a solid foundation for the model specification of micro-incentives for shadow economy participation. First, the model

[11]In particular, a reliability value of at least 0.9 is considered reliable.

[12]See Campbell and Fiske (1951), Cook and Campbell (1979) and in particular Drost (2011) for detailed explanation of the types of validity.

looks at the probability of participation in recognised dimensions of SE activity. The dimensions include incomplete accounting records of transactions, cash-based transactions, non-registration, concealment of activities from official scrutiny and harassment arising from non-compliance with regulations. Second, the incentives for participation as gathered from the literature reviewed identify gender, marital status, education, ownership status of the business, the source of finance, tax morale, the size of the business and hours of work as reasons for participation. This leads to the following empirical specification;

Pr(SE dimension) = f(gender, age, marital status, education, ownership status of the business, the source of finance, tax morale, size of the business, hours of work) (3.13)

The probability of participation [*Pr(SE dimension)*] is captured using the dimensions earlier discussed. This brings up the following specifications of the model;

Pr(incomplete accounting records) = f(gender, age, marital status, education, ownership status of the business, the source of finance, tax morale, size of the business, hours of work) (3.14a)

Pr(cash-based transactions) = f(gender, age, marital status, education, ownership status of the business, the source of finance, tax morale, size of the business, hours of work) (3.14b)

Pr(non-registration) = f(gender, age, marital status, education, ownership status of the business, the source of finance, tax morale, size of the business, hours of work) (3.14c)

Pr(concealment) = f(gender, age, marital status, education, ownership status of the business, the source of finance, tax morale, size of the business, hours of work) (3.14d)

Pr(harassment) = f(gender, age, marital status, education, ownership status of the business, the source of finance, tax morale, size of the business, hours of work) (3.14e)

3.2.6 Technique of analysis for the survey approach

Descriptive statistics are used to summarise a set of data. For the micro-approach to the SE, simple measures such as percentage distributions, measures of central tendency, and dispersion were used. Specifically, sums, percentage distributions, the

mean (average), and standard deviation[13] were used to describe the related outcomes from the survey. This analytical method was used to fulfil the study's three objectives.

The probit regression model was also used to realise the study's first objective using outcomes from the survey conducted. The estimation technique was the maximum likelihood method. The probit regression model was justified in the sense that it is usually used when the starting point is a latent normal regression model (Cameron and Trivedi, 2005). A latent variable is an unobserved variable. The latent variable model is used when the binary outcomes result from individual choice. Involvement in the shadow economy is a matter of choice, and on this basis; the probit model was used. In line with Folawewo (2006), the choice of the probit regression model was preferred because it allowed for binary dependent variables. The model is advantageous for quantifying the relationship between the probability of participation in selected SE dimensions and its determinants. The bivariate probit model was applied to selected outcomes to derive estimates of the incentives for participation.

The empirical model of shadow economy participation is formulated as a binary-based model. A linear regression model of the form presented in equation 3.15 generates the latent dependent variable Y_i^*;

$$Y_i^* = x_i^T \beta + u_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + ... + \beta_k X_{ik} + u_i \quad (3.15)$$

Where;

Y_i^* = is an index variable for the observation i that is unobservable

x_i^T = $(1, X_{i1}, X_{i2}, ... X_{ik})$, a $1 \times K$ row vector of regressor values for observation i; it is a binary explanatory variable that is X_{i1} =1 if observation i displays a specific attribute and 0 if otherwise.

$x_i^T \beta$ = 1 x 1 scalar called the index function for observation i

β = $(\beta_0, \beta_1, \beta_2, ..., \beta_k)$ is a K x 1 column vector of regression coefficients

u_i = an iid $N(0, \sigma^2)$ random error for observation i.

[13]The standard deviation measure how dispersed or spread out the observations are or simply the square root of the expected value of the squared deviations of the values from their mean.

The observable outcomes of the model are represented by a binary variable Y_i linked to the unobserved dependent variable Y_i^*;

$$Y_i = \begin{cases} 1 \text{ if } Y_i^* > 0, \\ 0 \text{ if } Y_i^* \leq 0, \end{cases} \tag{3.16}$$

The binomial probabilities of equation 3.16 are represented in terms of the standard normal *c.d.f*;

$$\Pr(Y_i = 1) = \Pr(Y_i^* > 0) = \Phi(x_i^T \beta)$$

$$\Pr(Y_i = 0) = \Pr(Y_i^* \leq 0) = 1 - \Phi(x_i^T \beta) \tag{3.17}$$

However, since the coefficients of the probit regression are difficult to interpret, the marginal effects[14] are derived and interpreted. For the outcomes of the probit model to be useful, it has to be converted to marginal effects. According to Cameron and Trivedi (2005), the marginal effects measure the effect of a change in one regressor on the conditional mean of *Y*. Therefore, attention shifts to the marginal probability effects, which are the partial effects on the probit index function of each explanatory variable. The regression function in equation (3.15) is differentiated with respect to the regressors to obtain the slope coefficients β_j;

$$\frac{\partial x_i^T \beta}{\partial x_{ij}} = \beta_j \tag{3.18}$$

The marginal probability effect of an explanatory variable equals;

i. The value of the index function $x_i^T \beta$ when x_{ij} =1 and other regressors equal fixed values minus

ii. The value of the index function $x_i^T \beta$ when x_{ij} =0 and other regressors equal fixed values.

The marginal effect is computed by evaluating the standard normal *c.d.f* of a binary explanatory variable $\Phi(x_i^T \beta)$ at the two different values of the explanatory variable and then taking the difference. The marginal probability effect x_j is presented as;

$$x_j = \Phi(x_{1i}^T \beta) - \Phi(x_{0i}^T \beta) \tag{3.19}$$

[14]This study interprets the marginal effects in terms of the marginal increase/decrease in the probability of being in the shadow economy considering the explanatory variables.

It can also be represented as;

$$\frac{\partial \Pr(y_i = 1)}{\partial x_k} = \Phi(x\beta)\beta_k \tag{3.20}$$

Y_i is represented by binary values of the dimensions of the shadow economy. It includes incomplete accounting records, cash-based transactions, non-registration status, harassment, and concealment. The dummy takes a value of 1 for each of these dimensions.

The likelihood of participating in shadow economic activities depends on the following set of observable factors of interest (see appendix for details); social-economic characteristics (gender, age, marital status and education), and ownership status of the business (sole proprietorship, partnership, family-owned, cooperative, registered business and others). Others include the sources of finance (bank loan, microfinance bank loan, association support, informal savings, moneylenders, friends and family, remittances from abroad, personal savings, government and non-governmental organization (NGOs), tax morale (response to a proposed increase in taxes), size (measured by income), and hours worked are captured by the vector x_i. The set of parameters β reflects the impact of changes in *x* on the probability of participating in any dimension of SE.

The model to be fitted is;

$$Pr(SE\ dimension_i=1) = \Phi(\beta_o + \beta_1\ gender_i + \beta_2\ marital\ status_i + \beta_3\ Education_i + \beta_4\ ownership\ status\ of\ business_i + \beta_5\ source\ of\ finance_i + \beta_6\ tax\ morale_i + \beta_7\ size\ of\ business_i + \beta_8\ hours\ of\ work) + u_i \tag{3.21}$$

Where:

Φ is the cumulative normal distribution.

Pr(SE dimension$_i$) = an indicator variable of the shadow economy, which includes incomplete accounting records, cash-based transactions, non-registration status, harassment and concealment. They are binary variables, which take a value of 1 for the presence of the attribute and 0 otherwise.

Gender, age, marital status, education, ownership status of the business, source of finance, tax morale, size of the business, hours of work are categories of outcomes whose sub-categories are binary (dummy) explanatory variables whose value = 1 if the observation displays an attribute and 0 if otherwise.

i = refers to the owner of the enterprises

$\beta_o, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ and β_8 represents the coefficients of the regression

u_i = error term/the unobserved variable

The general relationship between the indicators and factors influencing the SE are discussed as follows;

Dimensions of the SE (dependent variables)

i. Incomplete accounting records: Aryeetey, Baah-Nuakoh, Duggleby, Hettige and Steel (1994) note that for fear of being assessed by tax and regulatory authorities, a majority of SE participants keep accounting records to memory. Asuquo, Ejabu, Bogbo, Atu and Adejonpe (2018) supported this notion in their study, which focused on the accounting behaviour of small and medium-scale enterprises. They found out that memorising accounts or keeping single entry accounts hinders tracking of transactions. This behaviour continues because owners of microenterprises sometimes lack the skills to keep and maintain proper accounting records.

ii. Cash-based transactions: Credit features of the SE include the limited access to official credit sources relative to the formal sector, and cash use being the dominant medium of exchange (Schneider, Buehn and Montenegro, 2010). Dating back to Cagan's (1958) seminar work, monetary aggregates have been seen as an indicator of the SE.

iii. Non-registration: Due to the time and cost of registration in the formal sector, many microenterprises do not register their activities.

iv. Concealment: To avoid undue visibility to the regulatory authorities, many SE firms conceal the extent of their activities.

v. Harassment: Arises from detection for non-compliance with regulations by authorities, which may result in harassment of the owners of such enterprises.

Factors determining participation in the SE (independent variables)

i. Gender: Women are more likely than their male counterparts to take part in SE activities. This is based on frequent entry and exit from the labour force due to family pressures. They dominate the trade sector.

ii. Age: Youths usually dominate SE activities. As they grow older and obtain more education and experience, they get absorbed in the formal sector.

iii. Marital status: The responsibility that goes with having dependants raises the incentives for participation. Therefore, the married category is an important positive determinant of the SE.

iv. Education: Participation in SE activities is positively related with no education.

v. Ownership status of the business: Sole proprietorship is the dominant category, and it is strongly linked to involvement in the SE.

vi. Source of finance: Personal savings predominate, and it is a reason such businesses remain small.

vii. Tax morale: The higher the tax morale, the lower the incentive to participate in SE activities.

viii. Size of business: This is measured by the income generated by the business, the smaller the size, the higher the incentive to participate in SE.

ix. Hours of work: The lower the hours worked, the more the likelihood of participation.

3.3 Methodology for the macro-based models

The currency demand (CD) model, Multiple Indicators, Multiple Causes (MIMIC) model, and the growth model represent the macro-based models. The CD and MIMIC models address the objectives of determinants and magnitude of the SE, while the growth model examines the effect of the size of SE on economic growth. The currency demand model is used as a means to an end, in the sense that it is used with the MIMIC model to obtain values of the SE as a percentage of GDP.

3.3.1 Specification of the MIMIC and the currency demand model

Objective 1: Macro-based incentives for participation in the shadow economy

This model includes in its assessment, macroeconomic factors related to the SE. The incentives for participation are determined by considering the shadow economy as a latent variable. This is linked with its related causes and indicators whose signs are determined by economic theory. The starting point for specifying the model proceeds along with the argument on what causes the shadow economy. Three schools of thought,

the dualist, structuralist and legalist schools opine that it arises due to the inability of the formal sector to absorb excess labour, the nature of development and the cost and time associated with formalisation.

De-Soto (1989) suggests that the SE arises from institutional restrictions occasioned by the imposition of regulations on the formal sector. Firms in the SE usually cannot fulfil these regulations because of their small size, and this evolves to a vicious circle of SE activities. An implication is tax evasion, as inferred from the study carried out by Allingham and Sandmo (1972). The choice not to pay taxes depends on the penalty imposed and the probability of detection. These arguments formed the basis of the adaptation of the endogenous growth theory by Loayza (1997) to investigating the drivers of the shadow economy.

The analytical framework is the MIMIC model, which traces the relationship between SE, its causes, and indicators. The MIMIC model is selected because it is not limited to one cause or indicator as the other approaches reviewed. The model has two components; the structural and the measurement models, respectively.

The structural equation model is given as;

$$\eta = \gamma' x + \varsigma \tag{3.22}$$

Where *x = tax revenue (percentage of GDP), unemployment rate (%), government consumption (percentage of GDP), inflation* is a (1 x 4) vector that represents observable causes of the shadow economy (η) and γ is a (1 x 4) vector of coefficients describing the relationship between the shadow economy and its causes. ς represents the unexplained component that is the structural disturbance term.

The measurement model that characterises the link between the shadow economy and its observable indicators is specified as follows;

$$y = \lambda\eta + \varepsilon, \tag{3.23}$$

Where *y = M0/M1, GDP (annual percentage growth), and the labour participation rate* is a (1 x 3) vector of indicator variables of the shadow economy. Where *M0/M1* represents the ratio of currency outside banking system (M0) to M1 (broad money). λ is the vector of regression coefficients, η is the shadow economy, and ε is a (1 x 3) vector representing the measurement error term.

Equation (3.22) is substituted into equation (3.23) to obtain;

$$y = \lambda(\gamma' x + \varsigma) + \varepsilon \tag{3.24}$$

Expanding equation (3.24) and defining $\Pi = \lambda\gamma'$ as a matrix with rank equal to 1 and $z = \lambda\varsigma + \varepsilon$, it is rewritten to obtain the reduced multivariate regression form of the MIMIC model;

$$y = \Pi' x + z \tag{3.25}$$

The error term in equation (3.25) is a vector of linear combinations of the structural equation and measurement model's white noise error terms. The identification and estimation of the MIMIC model require the a priori value of one of the indicator variables (Bollen, 1989). The selection of a variable is based on economic theory. The constrained variable is the labour participation rate, which is fixed to one.

A route diagram is used to illustrate the hypothesized MIMIC model, as seen in Figure 3.1. The diagram comprises the observed variables in the rectangular boxes, the latent variable is in the circle, while the arrow indicates that the variable at the base affects the variable at the head.

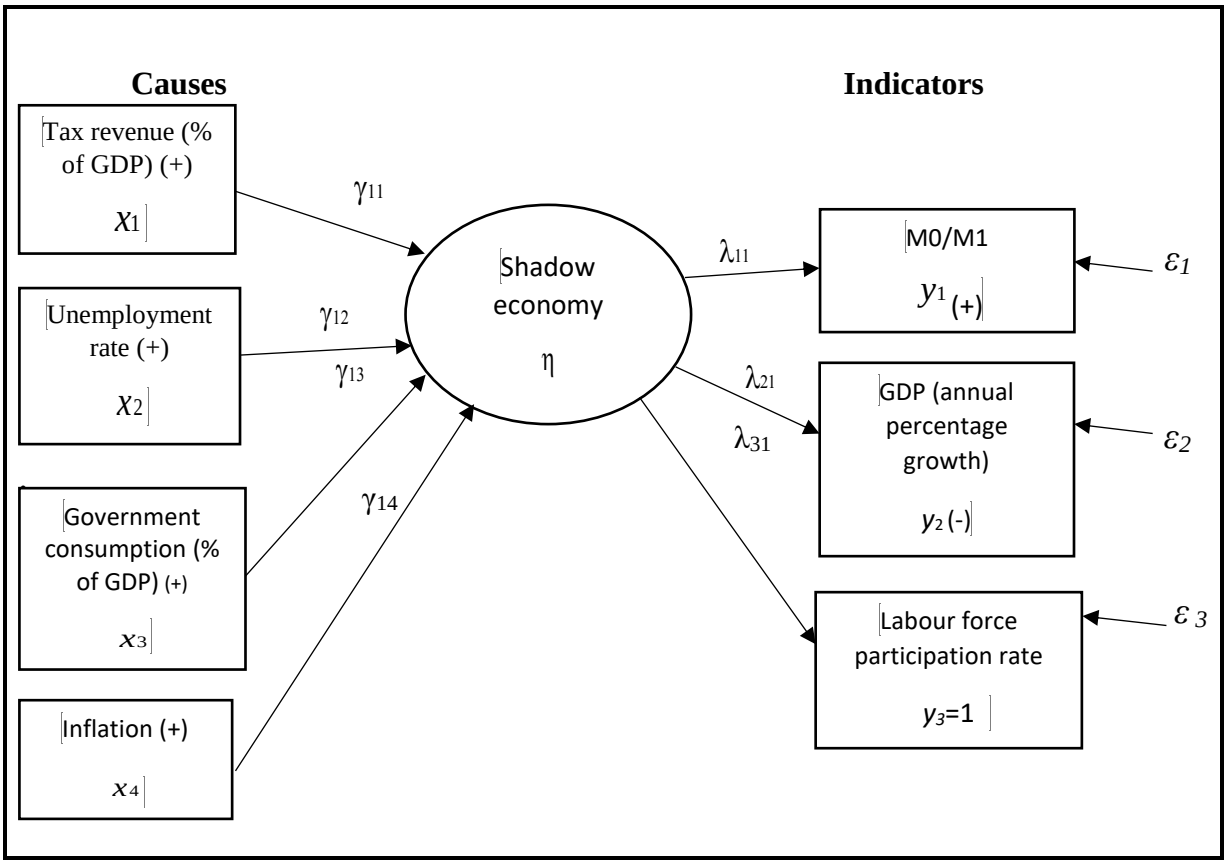

Figure 3.1: The MIMIC (4-1-3) model

Source: Author

From Figure 3.1, it is deduced that the observed causes determine the SE, which influences the indicator variables. The parameters and its *a priori* sign are also discussed in terms of their relationship to the SE.

Causes

The causes are attributed to taxes, unemployment and government consumption and inflation, which are discussed as follows.

i. Taxes encourage the growth of the shadow economy. The greater the tax burden, the larger the size of the SE. The proxy for this variable is direct tax as a proportion of GDP (Brambila-Macias and Guido, 2010; Schneider et al. 2010).

ii. Unemployment is an indicator of adverse economic situations, and it affects both the official and shadow economy (Brambila-Macias and Guido, 2010). An increase in the unemployment rate encourages the growth of the shadow economy.

iii. Government size gives insight into its efficiency. Excessive regulations give room for corruption, especially when it is necessary to hasten procedures. The proxy used in this study is government final consumption expenditure (percentage of GDP)[15] , and it is positively linked to the shadow economy.

iv. Inflation as an indicator of the economy's well-being influences the shadow economy positively. The expected sign is positive (Schneider et al., 2010).

Indicators

i. The monetary indicator is given by M0 divided by M1 which is the usual reference variable in line with Schneider et al (2010). There is a positive relationship between the SE and currency in circulation.

ii. The GDP growth indicator shows if the economy is progressing. In line with the structuralist school, SE activities would automatically phase out as the economy grows and develops. Hence, a negative relationship is posited (Wu and Schneider, 2019).

[15]The size of government is also a proxy for indirect tax.

iii. The labour force indicator is given by the labour participation rate proxied by the percentage of the population aged 15 to 64 years (Schneider et al., 2010). The larger the SE, the lower the total formal sector employment. This indicator is fixed to one.

Objective 2: Size of the shadow economy

The size is obtained by applying the benchmarking procedure to the result of the MIMIC model and using it with the results generated from another measure of the shadow economy (see Hassan and Schneider, 2016). MIMIC results are used to calculate an index obtained by multiplying the coefficients of the significant causal variables with the respective time series. The index only provides relative values that have to be converted to absolute values. The choice of the currency demand model is because increases in currency are attributed to a rising tax burden, which is an incentive for participation. Second, it helps disaggregate changes in currency demand that arise from developments in macroeconomic variables and that which is attributable to tax. In the tradition of the Tanzi model and following Faal (2003), the real currency demand function was specified in natural logarithms taking into consideration, the availability of data;

$$\ln C_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln T_t + \beta_3 \ln R_t + \beta_4 \ln \pi_t + \beta_5 \ln F_t + \varepsilon_t \tag{3.26}$$

With $\beta_1>0$, $\beta_2>0$, $\beta_3<0$, $\beta_4<0$ *and* $\beta_5<0$

Where *C* is measured by real currency in circulation, *Y* is real GDP, *R* is the real interest rate, inflation rate is denoted by π, *F* represents financial innovation proxied by the sum of Automated Teller Machines (ATMs) and bank branches while *T* is the sum of real custom and excise duties and company tax revenue divided by the real GDP and ε_t is the error term. To estimate the magnitude of the SE, estimates of total currency holdings with the tax variable ($\hat{C}$) are generated for each year and thereafter without the tax variable ($\tilde{C}$). The difference between the two estimates generates illegal money (IM);

$$IM = \hat{C} - \tilde{C} \tag{3.27}$$

Legal money *(LM) = M1 – IM*

Where *M1* stands for broad money supply.

The velocity of money (*v*) for SE transactions is given as;

$$v = \frac{Y}{LM} \tag{3.28}$$

The size is estimated by multiplying the illegal money by the velocity of money;

Size of shadow economy (η^*) = *IM* (v) (3.29)

The procedure of obtaining the shadow economy as a percentage of the GDP is referred to as the benchmarking procedure. There are several benchmark procedures (see Schneider and Dell' Anno, 2008). There is no consensus as to the benchmarking procedure superior in the literature. However, Schneider et al. (2010) originated the most widely used procedure. It involves calibrating the ordinal estimates into cardinal values and thereafter converting the index to real values. This requires a prior estimate of the shadow economy in Nigeria. In this study, it is written as;

$$\eta_t = \frac{\tilde{\eta}_t}{\tilde{\eta}_{1975}} \eta^*_{1975} \tag{3.30}$$

Where η_t represents the size of the shadow economy at time *t*, $\tilde{\eta}_t$ denotes the value of the MIMIC index at time t. $\tilde{\eta}_{1975}$ is the value of the MIMIC index in the year 1975, which is the base year adopted. The base year was selected on the assumption that the mid-1970s heralded the beginning of important changes in the economy that made the shadow economy conspicuous. η^*_{1975} is the currency demand estimate of the shadow economy in the base year.

The results from the currency demand model estimated in this work served as the exogenous value. In line with Schneider et al. (2010), the currency demand equation is used to obtain the base value of the shadow economy so that the MIMIC model index can be used to calculate the magnitude of the SE.

3.3.2 Specification of the growth model

Objective 3: Effects of the shadow economy on economic growth.

A simple production function is specified with the shadow economy (SE) determining the level of output.

$$Y = f(SE) \tag{3.31}$$

Equation 3.31 is augmented with standard variables identified in the growth literature as influencing growth (see Loayza, 1997).

$$Y = f(K, L, SE, OPEN, TGDP) \tag{3.32}$$

Where *Y* measures economic growth measured by real *GDP* per capita, *K* is capital stock measured by the gross fixed capital formation, and *L* is human capital captured by tertiary

school enrolment. The choice of the human capital proxy is premised on the availability of data. *SE* represents the size of the shadow economy, as a percentage of GDP, OPEN is the measure of openness defined as the ratio of the sum of exports and imports to GDP. TGDP is trend GDP, and it captures technological change. It is calculated as the fitted value of the regression of time on nominal GDP (see Ogun, 2014). All variables are expressed in natural logarithm in order to interpret the coefficients in terms of elasticity. Therefore, equation 3.32 is rewritten as;

$$\ln Y_t = \beta_0 + \beta_1 \ln K_t + \beta_2 \ln L_t + \beta_3 \ln SE_t + \beta_4 \ln OPEN_t + \beta_5 \ln TGDP_t + \varepsilon_t \quad (3.33)$$

ε_t is the error term. Theoretical signs for the coefficients are as follows; β_1, β_2, β_4 *and* β_5 >0 while β_3 <0.

3.3.3 Method of analysis of the macro-models

3.3.3.1 Preliminary tests

Descriptive Statistics

Simple descriptive statistics such as mean (average), median, maximum, minimum, standard deviation,[16] skewness, and the Jarque-Bera values are used in this study to describe the data.

Stationarity Tests

The variables in the currency demand model and growth model specified in equations 3.26 and 3.33 were evaluated by testing their time-series properties. The non-stationarity of time series is a problem in econometric analysis because it generates spurious results (Charemza and Deadman, 1997). Engle and Granger (1987) defined an integrated series as a non-stationary series (X_t), which can be transformed into a stationary series by differencing *n* times. The order of integration of each variable needs to be identified before any sensible regression can be performed. Concerns about the time-series properties of the variables used were evaluated using the Augmented Dickey-Fuller (ADF) test to check the stationarity of the series used.[17] The ADF test controls for higher-

[16]The standard deviation measure how dispersed or spread out the observations are or simply the square root of the expected value of the squared deviations of the values from their mean.

[17] Other tests include the GLS detrended Dickey-Fuller (DFGLS), Phillips-Perron (PP), Kwiatkowski, *et. al.* (KPSS), Elliot, Rothenberg, and Stock (ERS) Point Optimal, or Ng and Perron (NP) tests.

order correlation by adding lagged left-hand side variables as additional explanatory variables (Dickey and Fuller, 1981).

$$\Delta y_t = \mu + \beta_t + \gamma y_{t-1} + \sum_{j-1}^{p-1} \phi_j \Delta y_{t-j} + \varepsilon_t \tag{3.34}$$

Where Δ represents the difference operator, p is the lag length, while y_t represents the variable used in the model. This specification is used to test the null hypothesis (H_0) $\beta = \gamma = 0$ for a model with a time trend. The determination of the optimal lag length is based on the minimum value of the Akaike and Schwarz information criteria and alternatively examining the t statistic on the last coefficient.

The interest is in testing the negativity of γ. The‘t’ statistic associated with γ is examined and compared with the critical values. Mackinnon (1991)'s simulated critical values are used. If the computed‘t’ statistic is more negative than the critical value for a particular number of observations, the null hypothesis (H_0) is rejected while the alternative hypothesis (H_1) of the non-presence of stationarity is accepted. The test for higher levels of integration is conducted if the null hypothesis is accepted.

3.3.3.2 The MIMIC model

This model is a special case of the Structural Equation Model (SEM). The method used to obtain the estimates of the parameter is the Maximum Likelihood with Missing Values (MLMV). It captures variables that have missing observations. This is because it uses all observations by assuming joint normality of all observed variables with missing values assumed to be missing at random (MAR) (StataCorp, 2013). This retrieves as much information as possible in cases where missing observations occur. The Maximum Likelihood (ML) estimates is obtained when the value of the parameter that maximises the likelihood function is found. The ML function is used by applying the iterative process to derive the estimates that minimise the fitting function. The technique used to obtain the standard error is the observed information matrix (OIM).

In the MIMIC model specified for this study, the unobserved variable is the shadow economy, which is linked to indicator variables. Although the sample size must be reasonably large, Brambila-Macias and Guido (2010) proposed that 35 observations per variable are adequate. This study uses 45 observations, and this surpasses the

recommended number of observations. The econometric software used to estimate the MIMIC model is STATA 13.

Goodness-of-fit statistics

Some goodness-of-fit statistics derived from the MIMIC model include the Root Mean Square Error of Approximation (RMSEA), Chi-square, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Coefficient of Determination (CD), Akaike's Information Criteria (AIC), and Bayesian Information Criteria (BIC).

The RMSEA statistic is said to be close, if the lower bound is below 0.05 and weak, if the upper bound is above 0.10 (Browne and Cuddeck, 1993). Hu and Bentler (1999) have suggested a RMSEA statistic less than or equal to 0.06 as the cut-off for a good model fit. By convention, the model is a good fit if the RMSEA is less than 0.05, and perfect if equal to zero. However, the test is not robust if the sample size is less than 200 observations (Hu and Bentler, 1999). This is because, as the sample size increases, the RMSEA value decreases.

The chi-square value should not be significant ($p>0.05$), it indicates that the model is satisfactory. The Bentler Comparative Fit Index (CFI) compares the existing fit model to a null model that assumes uncorrelated indicator variables in the model. The CFI varies from zero to one and for the CFI and TLI; a value close to one indicates a good fit (Tucker and Lewis, 1973). In the case of the coefficient of Determinant (CD), a perfect fit corresponds to one, and it is similar in interpretation to the R^2.

3.3.3.3 The currency demand model

The Ordinary Least Squares (OLS) multiple regression analysis is the technique of analysis applied to the currency demand model.

3.3.3.4 The growth model

Cointegration Tests

The next step is applying the cointegration technique of Engle and Granger (1987) to the I(1) variables. Many macroeconomic variables are non-stationary. A remedy is to difference a series successively until stationarity is achieved, but this leads to the loss of long-run properties. Phillips (1987) proves that a regression involving integrated variables is spurious in the absence of cointegration. Cointegration involves non-

stationary series economic data series, which can be combined into a single series, which is stationary. Time series variables that drift together at roughly the same rate are said to be cointegrated (Greene, 2008). If the series are integrated and cointegrated, then an error correction model can be used to describe the short-run dynamics. There are three main approaches to testing cointegration, namely the Engle and Granger (1987) method, the Johansen Vector Autoregression (VAR) approach, and the bounds cointegration test.

The Engle and Granger method involves estimating a simple static equation with no lags. The cointegration model is valid when the residuals are stationary and is achieved by applying a suitable stationarity test to the residuals.

The Johansen procedure is used to test the cointegration of the series (see Johansen, 1995; Johansen and Juselius, 1990). The test for cointegration is carried out within the context of a simple Vector Autoregression model (VAR) as presented below;

$$y_t = \Gamma y_{t-1} + \varepsilon_t \tag{3.35}$$

Where y_t is a vector of variables at time t, Γ is the coefficients on the lag of y_t, ε_t is a vector of unobserved sequentially independent, jointly normal errors with zero mean and constant covariance. It is assumed that y_t is not stationary, so equation (3.35) is rewritten by taking the first difference;

$$\Delta y_t = \Pi y_{t-1} + \varepsilon_t \tag{3.36}$$

The transformation of equations (3.35) into (3.36) is called the cointegrating transformation. Where Δ is the difference operation, while the matrix Π produces linear combinations of the variables in y_t with rank r. The cointegrating rank can be tested using two statistics. Johansen (1995) derives both, and they are the maximum eigenvalue (λ_{max}) and trace statistic (λ_{trace}). Testing starts from $r = 0$, that is the hypothesis that there is no cointegrating vector in the VEC model. If it cannot be rejected, the procedure stops since there is no confirmation of the existence of cointegrating vectors. If rejected, it is possible to check sequentially the hypothesis that $r < 1$, $r < 2$, and so on until it cannot be rejected. The statistic obtained must be higher than their respective critical values for the alternative hypothesis to be accepted. The cointegrating equation was used to derive the estimates of the currency demand model.

The parsimonious error correction model

The variables in the growth model are subjected to stationarity tests and, subsequently, cointegration tests. Once the cointegration test confirms the long-term relationship, a parsimonious error correction model that is based on the general to specific methodology is estimated to determine the relationship between economic growth and the shadow economy (percentage of GDP). The model is specified as;

$$\Delta \ln y_t = \alpha_0 + \sum_{t=1}^{n} \alpha_1 \Delta \ln y_{t-1} + \sum_{t=0}^{n} \alpha_2 \Delta \ln se_{t-1} + \sum_{t=0}^{n} \alpha_3 \Delta \ln q_{t-1} + ECM_{t-1} + u_t \tag{3.37}$$

Where y_t represents GDP growth, q_t the vector of independent variables, ECM_{t-1} is the error correction term, and u_t the error term.

To obtain a parsimonious model, insignificant variables are deleted. However, none of the diagnostic tests should be failed, until the parsimonious model is obtained.

3.4 Data Description and Sources

Both primary and secondary sources of data were used for this study. The survey conducted on owners of microenterprises was the source of data for the probit regression model, which was used to assess the micro-determinants of the SE. The variables of interest for the MIMIC model were taxes as a percentage of GDP, inflation rate, government consumption as a percentage of GDP, unemployment rate, currency outside the banking sector and labour force participation rate. Variables of interest in the currency demand model included real currency in circulation, real GDP, real interest rate, financial innovation, and taxes as a ratio of GDP. In respect of the growth model, the GDP per capita (annual percentage), gross capital formation, tertiary enrolment rate, shadow economy (percentage of GDP), openness, and trend GDP were the variables of interest (see Appendix for more details). Data were obtained from the Central Bank of Nigeria Statistical Bulletin (several years) and the World Bank's World Development Indicators (2018). All estimates were analysed at $p \leq 0.05$.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Survey based results

4.1.1 Descriptive statistics

The Cronbach Alpha reliability test was used to check the reliability of the research instrument. The scale reliability coefficient was 0.947, which implies high reliability and consistency of the measurement instrument. The analysis will proceed by describing the survey outcomes using statistics such as the mean, standard deviation, minimum value and maximum value. Selected outcomes for Kano and Lagos states were aggregated and are presented in Table 4.1.

Table 4.1: Summary statistics of selected survey outcomes

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Gender					
Male	410	0.683	0.466	0	1
Female	410	0.317	0.466	0	1
Age					
15-24years	410	0.244	0.430	0	1
25-34years	410	0.390	0.488	0	1
35-44years	410	0.273	0.446	0	1
45-64years	410	0.085	0.280	0	1
Over64years	410	0.007	0.085	0	1
Age	410	32.844	10.044	20	65
Marital Status					
Single	410	0.405	0.491	0	1
Married	410	0.517	0.500	0	1
Separated/divorced	410	0.037	0.188	0	1
Widowed	410	0.041	0.200	0	1
Education					
No formal education	410	0.071	0.257	0	1
Primary	410	0.146	0.354	0	1
Secondary	410	0.490	0.501	0	1
Vocational	410	0.049	0.216	0	1
Tertiary	410	0.244	0.430	0	1
Status of Business					
Sole-proprietorship	410	0.754	0.431	0	1
Partnership	410	0.071	0.257	0	1
Family-owned	410	0.088	0.283	0	1
Cooperative	410	0.017	0.130	0	1
Registered business	410	0.029	0.169	0	1
Other business	410	0.041	0.200	0	1
Sector of activity					
Agriculture/forestry	410	0.112	0.316	0	1
Wholesale/retail trade	410	0.685	0.465	0	1
Manufacturing	410	0.063	0.244	0	1
Transportation	410	0.012	0.110	0	1
Accommodation	410	0.080	0.272	0	1
Other activities	410	0.046	0.210	0	1
Types of records kept					
Formal records	410	0.100	0.300	0	1
No formal records	410	0.900	0.300	0	1
Mode of payment for business transactions					
Cash payments	410	0.885	0.319	0	1
Others	410	0.115	0.319	0	1
Pension contributions					
Pension paid	410	0.022	0.147	0	1
No pension paid	410	0.978	0.147	0	1
Business account kept					
Accounts kept (yes)	410	0.198	0.399	0	1
Accounts kept (no)	410	0.802	0.399	0	1
Payment channel					
Payments others	410	0.115	0.319	0	1
Payments cash	410	0.885	0.319	0	1
Source of credit					
Deposit money bank	410	0.012	0.110	0	1
Microfinance bank	410	0.044	0.205	0	1
Association support	410	0.066	0.248	0	1

Informal savings	410	0.188	0.391	0	1
Money lenders	410	0.010	0.098	0	1
Family and friends	410	0.085	0.280	0	1
Remittances from abroad	410	0.010	0.098	0	1
Personal savings	410	0.427	0.495	0	1
Government/NGO	410	0.007	0.085	0	1
Others	410	0.151	0.359	0	1
Registration					
Registration (yes)	410	0.154	0.361	0	1
Registration (no)	410	0.846	0.361	0	1
Response to an increase in tax					
Support	410	0.288	0.453	0	1
Indifferent	410	0.339	0.474	0	1
Oppose	410	0.373	0.484	0	1
Income earned					
Less than ₦30000	410	0.620	0.486	0	1
₦30,001-50,000	410	0.166	0.372	0	1
₦50,001-100,000	410	0.137	0.344	0	1
₦100,001-500,000	410	0.029	0.169	0	1
₦500,001-1,000,000	410	0.010	0.098	0	1
₦1,000,001 and above	410	0.039	0.194	0	1
Hours worked					
Less than 20 hours	410	0.093	0.290	0	1
20 to 35 hours	410	0.312	0.464	0	1
36 to 40 hours	410	0.307	0.462	0	1
Over 40 years	410	0.288	0.453	0	1
Harassment by officials					
Yes	410	0.200	0.400	0	1
No	410	0.800	0.400	0	1
Concealment of premises					
Yes	410	0.500	0.501	0	1
No	410	0.500	0.501	0	1

Source: Author's computation

The variables were recoded to take a value of 0 for the absence of the attribute and 1 for the attribute. The statistics presented in Table 4.1 show that the standard deviation is within reasonable bounds[18]. This justifies the use of the probit model. The mean values indicate that a significant percentage of participants in the shadow economy are males, are aged between 25 and 34 years, are married, have completed secondary school, are sole proprietors, and are involved in trading activities. In addition, owners of microenterprises keep no accounting records, carry out transactions using cash, do not make pension contributions on behalf of employees, keep no business account, obtain credit for business from informal saving, do not register business, will oppose any increase in taxes, earns less than ₦30,000 per month and work between 20 to 35 hours weekly. The mean age of the owners of microenterprises was about 34 years with an associated standard deviation of 10 years.

The results reveal interesting insights into the dimension of SE activities. The dominance of males is not far-fetched. Women are engaged in certain sectors, such as trade and the household sector. This is corroborated by the various surveys carried out in Nigeria (see CBN/NISER/FOS, 2010; NBS, 2010) and Okoroafor (1990). The age bracket with the most participation is those aged between 25 and 34 years and indicates the youthfulness of those involved. The predominance of this age group is not surprising, as earlier surveys have obtained similar results. It is expected that as they age, they gain more experience, which helps in getting formal sector jobs. A married individual with a poor paying formal job or none is more likely to engage in SE activities to make ends meet. While the NBS and SMEDAN (2012) revealed the prevalence of participation of uneducated persons in the SE, this study reveals the dominance of those who have completed secondary education. Although the results reveal the evolving nature of the SE as regards educational attainment and shrinking formal job opportunities for those in this category. In addition, the owners of the microenterprises displayed signs of being underemployed as indicated by the hours of work.

4.1.1.1 Dimensions of the shadow economy

The survey outcomes revealed several dimensions of the shadow economy. The discussion starts with the cash-based dimensions of the SE, as shown in Table 4.2.

[18]The values are low

Table 4.2: Records keeping/cash-based dimension of the shadow economy

Dimensions	Sample frequencies		Frequency distribution percentages	
	Lagos	Kano	Lagos	Kano
	206	204		
Accounting records of business				
Formal account keeping	11	30	5.5	15.0
Records for personal use	101	57	50.5	28.5
No written records kept	88	113	44.0	56.5
Total	**200**	**200**	**100.0**	**100.0**
Business bank account				
Yes	23	58	15.2	33.3
No	128	116	84.8	66.7
Total	**151**	**174**	**100.0**	**100.0**
Main payment channel for business transactions				
Cash	183	180	92.0	90.0
Cheque	12	10	6.0	5.0
Point of sale terminals	0	2	0.0	1.0
Internet banking	2	2	1.0	1.0
Others	2	6	1.0	3.0
Total	**199**	**200**	**100.0**	**100.0**
Source of finance				
Commercial bank loan	2	3	1.0	1.5
Microfinance bank loans	5	13	2.5	6.5
Association support/cooperative	24	2	12.1	1.0
Informal savings	30	45	15.2	22.4
Moneylenders	3	0	1.5	0.0
Loans from friends/relatives	25	9	12.6	4.5
Remittances from abroad	1	3	0.5	1.5
Personal savings	101	69	51.0	34.3
Government programme/NGOs/International organisation	3	0	1.5	0.0
Others	4	57	2.0	28.4
Total	**198**	**201**	**100.0**	**100.0**

Source: Author's computation

Only 5.5 per cent (11), and 15.0 per cent (30) of the businesses kept formal records. Despite the high educational background of respondents at Kano, only 43.5 per cent kept records of any sort as opposed to 56.0 per cent in Lagos. Of the total number of respondents, about 44.0 per cent (88) and 56.5 per cent (113) kept no written records of their business transactions. This confirms the difficulty of ascertaining and authenticating business transactions for compliance with official regulations. Accounting records can be used to measure the magnitude of the SE. Therefore, when those who keep records for personal use and those who keep no written records are summed up, it is about 94.5 per cent in Lagos and 85.0 per cent in Kano.

Having a business bank account reveals the extent to which a business is willing to declare its assets to an external body. Those who transact businesses formally will have a proportion of their transactions go through the banking system. Table 4.2 shows that only 15.2 per cent (23) of respondents in Lagos and 33.3 per cent (58) at Kano had accounts in the business's name. The majority, 84.8 per cent (128) and 66.7 per cent (116), had no business accounts. As an indicator of the shadow economy, it can be used to derive the size of the shadow economy. This implies that using the number of respondents that kept no business accounts, about 84.1 per cent and 66.7 per cent of the respondents in Lagos and Kano State respectively operated in the SE.

In both states, the principal payment instrument was cash, 92.0 per cent (183) in Lagos and 90.0 per cent (180) in Kano, followed by cheques and internet banking. Since the cash-based system of payment was high, this implies that the shadow economy could be as large as 90.0 per cent and above in Nigeria.

In the shadow economy, personal savings are the dominant source of credit. As much as 51.0 per cent (101) and 34.3 per cent (69) of the respondents obtained funds from their savings. Only 17.l per cent (34) and 9.0 per cent (18) sourced for funds from formal sources, namely the commercial bank loan, microfinance bank loans, association support/ cooperative society and government programme/NGO/international organisations.

Table 4.3: Employment/labour market dimension of the shadow economy

Dimensions	Sample frequencies		Frequency distribution percentages	
	Lagos	Kano	Lagos	Kano
	206	204		
Employment contract				
Written contract	16	24	10.4	12.1
Verbal agreement	49	124	31.8	62.6
No contract	89	50	57.8	25.3
Total	**154**	**198**	**100.0**	**100.0**
Employment benefits				
Pension				
Yes	2	7	2.6	4.3
No	76	157	97.4	95.7
Total	**78**	**164**	**100**	**100.0**
Paid holiday				
Yes	8	28	10.3	17.2
No	70	135	89.7	82.8
Total	**78**	**163**	**100.0**	**100.0**
Sick Leave				
Yes	46	31	49.5	20.7
No	47	119	50.5	79.3
Total	**93**	**150**	**100.0**	**100.0**
Maternity Leave				
Yes	30	35	37.0	24.0
No	51	111	63.0	76.0
Total	**81**	**146**	**100.0**	**100.0**
Other jobs				
Yes	39	24	19.4	12.2
No	162	173	80.6	87.8
Total	**201**	**197**	**100.0**	**100.0**
The employer in another job				
Government	-	10	-	5.1
Private sector (formal)	12	4	5.9	2.0
Private sector (informal)	4	1	2.0	0.5
NGO/International organisation	2	1	1.0	0.5
Religious organisation	4	-	2.0	-
Self-employed	18	7	8.9	3.6
Others	-	1	-	0.5
Categories of workers employed by the respondents				
Full-time paid workers	43	80	38.4	83.3
Part-time paid workers	30	18	26.8	18.6
Casual paid workers	46	78	41.1	17.5
Unpaid workers	52	10	46.4	10.3
Hours spent weekly running the business				
Less than 20 hours	21	16	10.9	8.4
20-35 hours	48	80	24.9	41.9
36-40 hours	90	35	46.6	18.3
Over 40 hours	34	60	17.6	31.4
Total	**193**	**191**	**100.0**	**100.0**

Source: Author's computation

Table 4.3 reveals that only 10.4 per cent (16) and 12.1 per cent (24) of the respondents in both states had a written contract with their employees. Kano state had a large number of respondents, 62.6 per cent (124) entered a verbal agreement with employees as opposed to Lagos that had many employers 57.8 per cent (89) having no agreement with their employees.

The non-availability or partial access to employment benefits is an indicator and effect of taking part in the shadow economy. The benefit that dominates is the sick leave at Lagos and maternity leave at Kano state. The least popular benefit is a pension, and it is an indication of vulnerability, and non-protection of workers employed. Further interaction with the respondents gave support to micro pension schemes targeted at those who work in the shadow economy to reduce dependency in old age.

In a bid to account for those who participate in shadow economic activities to augment their income, a question was posed to respondents on whether they held other jobs. About 19.4 per cent (34) in Lagos and 12.2 per cent (24) in Kano State replied in the affirmative to the question. The employer in the other job was mainly the formal private sector, followed by self-employment with none working for the government of Lagos State. In contrast, the majority had their second jobs in the government sector followed by self-employment in Kano State. This suggests that they earn a low income and want to supplement their income. On the other hand, 80.6 per cent (162) and 87.8 per cent (173) replied they held no other jobs. This reveals that over 80 per cent of those who operated in the shadow economy do so because they cannot get jobs and for survivalist reasons.

Of the respondents, who responded to the question on the categories of workers employed, it was observed that Lagos had a larger share (87.5 per cent) of casual paid and unpaid workers, when compared with Kano that had about 83.3 per cent of the respondents employing full time paid workers. The number of workers employed and the owners of the business gave information on the extent of participation in the shadow economy.

The intensity of participation is investigated by observing the hours worked. In Lagos, the majority spent 36 hours and above running their business, while, in Kano, the majority spent 20 to 35 hours running their businesses. However, the hours of work did

not reflect in the income earned as a majority earned below the ₦30,000 benchmark (see Table 4.4). In addition, 71.5 per cent (138) and 60.2 (115) of the respondents in Lagos and Kano states are underemployed going by the criteria laid down by the Nigerian National Bureau of Statistics in line with ILO guidelines.[19]On the other hand, 10.9 per cent (21) and 8.4 per cent (16) in both states were unemployed as they spent less than 20 hours running their business. Only 17.6 per cent (34) and 31.4 (60) of the respondents in both states were fully employed as they put in 40 hours and above weekly.

[19]Underemployment according to NBS(2010) 'occurs if you work less than full time which is 40 hours but work at least 20 hours on average a week …'

Table 4.4: Income/expenditure of owners of microenterprises

	Sample frequencies		Frequency distribution percentages	
	Lagos 206	Kano 204	Lagos	Kano
Average monthly income/profit				
Less than ₦30,000	103	89	66.5	46.1
₦ 30,001-50,000	33	35	21.3	18.1
₦ 50,001-100,000	11	45	7.1	23.3
₦ 100,001-500,000	6	6	3.9	3.1
₦ 500,000-1,000,000	0	4	0.0	2.1
₦ 1,000,0001 and above	2	14	1.3	7.3
Total	**155**	**193**	**100.0**	**100.0**
Average monthly expenses				
Less than ₦ 50,000	110	85	71.9	44.5
₦ 50,001-100,000	32	70	20.9	39.8
₦ 100,001-500,000	9	11	5.9	5.8
₦ 500,001-1,000,000	1	13	0.7	6.8
₦ 1,000,0001 and above	1	6	0.7	3.1
Total	**153**	**191**	**100.0**	**100.0**
Present worth of capital invested				
Less than ₦ 50,000	60	72	37.5	39.8
₦ 50,001-100,000	56	73	35.0	40.3
₦ 100,001-500,000	30	12	18.8	6.6
₦ 500,001-1,000,000	5	10	3.1	5.5
₦ 1,000,001 and above	9	14	5.6	7.7
Total	**160**	**181**	**100.0**	**100.0**

Source: Author's computation

As observed in Table 4.4, 66.5 per cent (103) of the respondents in Lagos made an average monthly income/profit of less than ₦30,000, followed by profit between ₦30,000 and ₦50,000 and third was the profits between ₦50,001 and ₦100,000. In Kano state, 46.1 per cent (89) of the respondents earned an average profit below ₦30,000, followed by ₦50,001 to ₦100,000 and ₦30,000 to ₦50,000. From this result, it is evident that the majority earned less than ₦30,000 and were not statutorily liable to pay taxes. Although, on observation of business premises by field workers, they noted that many of the business owners attempted to understate their income.

In Lagos state, 71.9 per cent (110) spent, on average, less than ₦50,000 monthly and 37.5 per cent (60) had the present worth of capital invested in their business valued at less than ₦50,000. Similarly, in Kano state, 44.5 per cent (85) spent less than ₦50,000 monthly on expenses and 40.3 per cent (73) valued the present worth of capital invested at between ₦50,001 and ₦100,000, and this was closely followed by the present worth of capital valued at less than ₦50,000. At the extreme were those who earned, spent and had the present worth of their capital valued at ₦1,000,001 and above. This category constituted less than 8 per cent in Kano state and 6 per cent in Lagos state.

Table 4.5: Registration of microenterprises

	Sample frequencies		Frequency distribution percentages	
	Lagos	Kano	Lagos	Kano
	206	204		
Registration of business				
Yes	21	42	10.3	20.8
In progress	16	13	7.8	6.4
No	167	147	81.9	72.8
Total	**204**	**202**	**100.0**	**100.0**
Reasons for non-registration				
Not aware of any requirement to register	28	18	15.8	8.6
Not sure where to register	8	8	4.5	4.3
Do not have time to register	8	9	4.5	4.8
To avoid dealing with government officials	23	38	13.0	20.3
To avoid the financial burden of taxes	30	23	16.9	12.3
Too small to register	95	30	53.7	16.0
To reduce production costs	3	9	1.7	4.8

Source: Author's computation

About 81.9 per cent (167) and 72.8 per cent (147) of the respondents in Lagos and Kano did not register their businesses, as observed in Table 4.5. In contrast, only 10.3 per cent (21) and 20.8 per cent (42) in Lagos and Kano registered their businesses. A smaller percentage had the registration of their business in progress. Inferences can be drawn from these results as regards the size of the shadow economy based on whether or not a business is registered with the government. On this basis, the shadow economy can be said to be as large as 89.7 per cent, and 79.2 per cent in Lagos and Kano states respectively when businesses not registered, and those whose registration is in progress are summed.

The main reason the owners of businesses failed to register in Lagos state was that they saw themselves as being too small to register, second, to avoid the financial burden of taxes and thirdly and oddly enough, they were not aware of any requirement to register their businesses. In Kano state, the reasons put forward in order of importance was; to avoid dealing with government officials, being too small to register and to avoid the financial burden of taxes.

Table 4.6: Tax payments and tax morale in the shadow economy

	Sample frequencies		Frequency distribution percentages	
	Lagos	**Kano**	**Lagos**	**Kano**
	206	**204**		
Payment of taxes to the government				
Full	82	128	42.7	65.3
Partially	41	28	21.4	14.3
Not at all	69	40	35.9	20.4
Total	**192**	**196**	**100.0**	**100.0**
Taxes/levies paid				
Company income tax	9	**7**	NA	NA
Personal income tax	21	14		
Value-added tax	16	2		
Business premises registration and renewal levy	11	38		
Shop/Market/Motor park rate	112	124		
Signboard permit	13	2		
Tenement rate	18	1		
Others	28	5		
Reasons for not paying taxes				
Taxes are too many	47	7	NA	NA
Taxes are high	53	28		
Taxes reduce profits	55	9		
Perceived deterioration in public sector services	9	6		
Not sure where to pay	6	12		
Earn below the taxable income	41	10		
Low risk of detection by tax authorities	2	9		
Reaction to an increase in tax paid				
Support	21	97	10.7	51.9
Indifferent	85	28	43.1	15.0
Oppose	91	62	46.2	33.2
Total	197	187	100.0	100.0

Source: Author's computation

Note: NA – not applicable

Table 4.6 reveals that 42.7 per cent (82) and 65.3 per cent (128) of the businesses in Lagos and Kano states, respectively, paid taxes in full to the government. These figures are distorted because many of the respondents thought paying shop/market/motor park rate amounts to paying taxes in full. Those who paid partially and not at all constituted 57.3 per cent (100) and 34.7 per cent (68) in Lagos and Kano.

The main reasons for non-payment of taxes in Lagos were, first, taxes reduce profits, second, taxes are high, and taxes are too many. In Kano, the primary reason was that taxes are high, second, is not being sure where to pay and third the fact that they earn below taxable income.

In examining the degree of morale of the citizenry as regards the payment of taxes, a question was posed to respondents on their reaction to an increase in taxes to be paid to the government. About 10.7 per cent (21) supported the proposition in Lagos, while 46.2 per cent (91) opposed. However, in Kano, 51.9 per cent (97) supported an increase, while, 33.2 per cent opposed an increase in tax paid. Indifferent respondents accounted for 43.1 per cent (85) and 15.0 per cent (28) in Lagos and Kano states. From these results, it is deduced that the tax morale is low in Lagos and high in Kano states. This is likely to aid policy aimed at boosting activities in the shadow economy.

Table 4.7: Outcomes of being in the shadow economy

	Sample frequencies		Frequency distribution percentages	
	Lagos	**Kano**	**Lagos**	**Kano**
	206	**204**		
Harassment by law enforcement agencies				
Yes	42	19	21.2	9.9
No	156	172	78.8	90.1
Total	**198**	**191**	**100.0**	**100.0**
Harassment by whom				
Police	3	3	1.5	1.6
Government officials	33	6	16.8	3.3
Others	5	0	2.5	0.0
NA	156	174	79.2	95.1
Total	**197**	**183**	**100.0**	**100.0**
Offences				
Nonpayment of taxes/levies	24	5	12.2	2.7
Non-adherence to rules	3	3	1.5	1.6
Failure to produce evidence	1	0	0.5	0.0
For bribes and tips	1	0	0.5	0.0
Service-based	4	0	2.0	0.0
Street trading	5	0	2.6	0.0
No offence	1	0	0.5	0.0
NA	157	174	80.1	95.6
Total	**196**	**182**	**100.0**	**100.0**
Effects of harassment on business				
Reduction of profits	21	7	10.9	3.6
Loss of property	9	2	4.7	1.0
Relocation costs	1	4	.5	2.1
Low sales	6	5	3.1	2.6
NA	156	174	80.8	90.6
Total	**193**	**192**	**100.0**	**100.0**
Concealment of goods, records or premises				
Yes	25	34	23.8	21.4
No	80	125	76.2	78.6
Total	**105**	**159**	**100.0**	**100.0**
Bank Loan				
Yes, successfully	9	12	4.6	6.2
Yes, failed	19	7	9.7	3.6
No	167	175	85.6	90.2
Total	**195**	**194**	**100.0**	**100.0**
Reasons for inability to get a loan				
Burdensome requirements	15	-	NA	NA
Insufficient collateral	8	3		
Low repayment capability	-	1		
High-interest rate	10	2		
Incomplete business registration documents	6	3		
Bad luck	-	1		

Source: Author's computation

To enforce compliance with specific formal sector regulation, law enforcement agents often harass those in the SE. In Table 4.7, 21.2 per cent (42) of the respondents in Lagos and 9.9 per cent (19) respondents in Kano State alleged harassment by law enforcement agents. Tax collection /government officials were the main culprits with 16.8 per cent (33) and 3.3 per cent (6) in Lagos and Kano state. Offences committed by the respondents in Lagos in descending order were non-payment of taxes/levies, street trading, service-based offences and non- adherence to rules (e.g. refusal to participate in sanitation activities), while in Kano, it was non-payment of taxes/levies and non-adherence to rules. The effects on their business activities were mainly a reduction in profits.

An outcome of enforcement by government officials was the concealment of goods, records, and premises. This was carried out to avoid penalties and indicates the level of illegality or criminality of SE activities. About 23.8 per cent (25) and 21.4 per cent (34) of the respondents in Lagos and Kano states respectively said they would conceal their activities if they get information that government officials were coming for an inspection.

Another effect of operating in the shadow economy is the difficulty of accessing credit from formal banking institutions. Only 4.6 per cent (9) and 6.2 per cent (12) of the respondents in Lagos and Kano successfully obtained loans in the twelve months preceding the survey period. About 85.6 per cent (167) and 90.2 per cent (175) never tried obtaining a loan. Prominent among the reasons for the inability to obtain loans was the burdensome requirements in Lagos state. Insufficient collateral and incomplete business registration documents were the prime reasons for the inability to obtain loans in Kano state.

4.1.1.2 The incentives to participate in the shadow economy

The socio-economic characteristics of owners of microenterprises

The socio-economic characteristics of respondents were analysed using the frequencies and associated percentages. This is a catalyst to achieving the first objective on the motivation for participation in the shadow economy. The results were disaggregated for Lagos and Kano states, where the survey was carried out to appreciate the similarities and differences as regards the occurrence of shadow economy activities. The results are presented in Table 4.8.

Table 4.8: Socio-economic characteristics of owners of microenterprises

Characteristics	Sample frequencies		Frequency distribution percentages	
	Lagos	Kano		
	206	204	Lagos	Kano
Sex: *Male*	102	175	51.8	86.2
Female	95	28	48.2	13.8
Total	**197**	**203**	**100.0**	**100.0**
Age: *15-24 years*	28	71	13.7	35.0
25-34 years	84	75	41.2	36.9
35-44 years	68	43	33.3	21.2
45-64 years	21	14	10.3	6.9
Over 64 years	3	0	1.5	0
Total	**204**	**203**	**100.0**	**100.0**
Marital status: *Single*	58	105	29.0	51.7
Married	120	91	60.0	44.8
Separated/Divorced	10	3	5.0	1.5
Widowed	12	4	6.0	2.0
Total	**200**	**203**	**100.0**	**100.0**
Educational Status:				
No formal education	24	1	12.4	0.5
Primary	47	8	24.4	4.0
Secondary	64	130	33.2	65.0
Vocational/technical	12	8	6.2	4.0
Tertiary	46	53	23.8	26.5
Total	**193**	**200**	**100.0**	**100.0**
Number of dependents				
0	8	47	7.5	31.1
1-3	50	53	46.3	35.1
4-7	46	36	42.6	23.8
8-10	4	10	3.8	6.6
11-15	0	6	0	3.3
Total	**108**	**152**	**100.0**	**100.0**

Source: Author's computation

Table 4.8 reveals that in respect of the gender distribution of respondents, the males constituted 86.2 per cent (175) and 51.8 per cent (102) respectively in Kano and Lagos while the females were 13.7 per cent (28) and 46.1 per cent (95). This result suggests some elements of cultural, religious bias, and the fact that women take care of their homes. This is another facet (household production) of the shadow economy, not covered by this thesis. Concerning the working-age population, which is composed of individuals between 15 and 64 years, the breakdown of both states, shows that 71.9 per cent and 54.9 per cent of the respondents were aged between 15 and 35 years in Kano and Lagos. This shows that the majority of those who are active in the shadow economy was youthful. Those aged 46 and above, constituted 6.9 per cent (Kano) and 11.8 per cent (Lagos). The educational status of the owners of microenterprises reveals that the majority had a secondary education with 33.2 per cent in Lagos and 65 per cent in Kano. The high education figures are due to the survey method used in Kano. During the period of the survey, there were several terror attacks in the state, and respondents were hesitant about being interviewed. Therefore, questionnaires were administered and collected at the convenience of the respondent. Therefore, those who volunteered to fill the questionnaires were mainly literates, and that accounts for the high percentage of literate respondents in Kano state as opposed to Lagos state. In Lagos, only 7.5 per cent (8) of the respondents had no dependents compared with 31.1 per cent (47) in Kano. About 88.9 per cent (96) of the respondents in Lagos had between 1-7 dependents as opposed to Kano with 58.9 per cent (89).

Table 4.9: Characteristics of microenterprises

Characteristics	Sample frequencies		Frequency distribution percentages	
	Lagos	Kano	Lagos	Kano
	206	204		
Status of business				
Sole proprietorship	172	133	85.1	65.8
Partnership	9	20	4.5	9.9
Family-owned business	10	26	5.0	12.9
Cooperative	0	7	0	3.5
Registered enterprise/company	6	6	3.0	3.0
Others	5	10	2.5	5.0
Total	**202**	**202**	**100.0**	**100.0**
Sector of activity				
Agriculture, forestry and fishing	34	10	16.8	5.0
Wholesale/Retail trade	128	151	63.4	75.9
Manufacturing	6	20	3.0	10.1
Transportation and storage	1	4	0.5	2.0
Accommodation and food services	19	14	9.4	7.0
Others	14	0	6.9	0
Total	**202**	**199**	**100.0**	**100.0**
Location of operation				
Home	12	15	5.9	7.4
Factory	2	6	1.0	3.0
Market	53	84	26.2	41.4
Shop	69	86	34.2	42.4
Roadside	41	7	20.3	3.4
Farm	2	1	1.0	0.5
Mobile/ No fixed location	19	4	9.4	2.0
Others	4	0	2.0	0.0
Total	**202**	**203**	**100.0**	**100.0**

Source: Author's computation

As revealed in Table 4.9, most of the business owners interviewed were sole proprietors. About 85.1 per cent (172), and 65.8 per cent (133) in Lagos and Kano respectively were sole proprietorships. This was followed by family-owned businesses, at 5.0 per cent (10) and 2.9 per cent (26). A partnership business follows closely at 4.5 per cent (9) and 9.9 per cent (20). The wholesale, retail trade sector dominates at 63.4 per cent (128) and 75.9 per cent (151) respectively in Lagos and Kano states. The agricultural sector follows closely at the second position, while accommodation and food services, others, manufacturing and transportation follow sequentially for Lagos state while for Kano, the sequence is manufacturing, accommodation, agriculture, and transportation.

Most business activities were located in the markets and operated from shops. The total percentage for Lagos was 60.4 per cent (122) and 83.8 per cent (170) in Kano. This was followed by roadside business in Lagos and use of residential homes in Kano.

Table 4.10 reveals that owners of microenterprises in Lagos and Kano have a very strong motivation to participate in shadow economy activities because of leisure, employment, source of income and profit reasons. The motivation with the highest frequency as to participating in SE activities is making a profit. This is unlike Schneider, Sookram and Watson (2006) that identified income and employment as the primary motivations. Likewise, respondents in both states have a strong motivation to meet the existing good/service gap. For the other reasons, the results are mixed, for instance, in Lagos, family tradition; existing infrastructure and disengagement from a place of work are a weak motivation, while in Kano they constitute a strong motivation for participation. In Lagos, access to finance and income flows for old age are very strong reasons, while in Kano State, they are just strong reasons for participation in the activity. Owners of microenterprises in Lagos are indifferent to the tax regime in place, while in Kano it is a tie between strong motivation and indifference. Lastly, concerning government support, it was established that those in Kano have a very strong motivation to participate in SE activities while in Lagos, it is a very weak motivation for participation.

Table 4.10: Motivation for participation in the shadow economy

Reasons for participation	Very strong motivation		Strong motivation		Indifferent		Weak motivation		Very weak motivation		Total	
	Lagos	Kano	Lagos	Kano	Lagos	Kano	Lagos	Kano	Lagos	Kano	Lagos	Kano
Leisure	33	103	24	67	15	12	12	4	11	3	95	189
	34.7	*54.5*	*25.6*	*35.4*	*15.8*	*6.3*	*12.6*	*2.1*	*11.6*	*1.6*	*100.0*	*100.0*
Family tradition	26	49	19	91	15	37	24	8	9	2	93	187
	12.6	*26.2*	*20.4*	*48.7*	*16.1*	*19.8*	*25.8*	*4.3*	*9.7*	*1.1*	*100.0*	*100.0*
Employment	53	87	42	62	5	16	6	15	10	4	116	184
	45.7	*47.3*	*36.2*	*33.7*	*4.3*	*8.7*	*5.2*	*8.2*	*8.6*	*2.2*	*100.0*	*100.0*
Source of income	85	88	35	79	5	6	3	14	11	7	139	194
	61.2	*45.4*	*25.2*	*40.7*	*3.6*	*3.1*	*2.2*	*7.2*	*7.9*	*3.6*	*100.0*	*100.0*
Profit	111	107	50	54	9	16	5	8	10	6	185	191
	60.0	*56.0*	*27.0*	*28.3*	*4.9*	*8.4*	*2.7*	*4.2*	*5.4*	*3.1*	*100.0*	*100.0*
Existing good/service gap	12	37	33	76	24	48	19	16	7	4	95	181
	12.6	*20.4*	*34.7*	*42.0*	*25.3*	*26.5*	*20.0*	*8.8*	*7.4*	*2.2*	*100.0*	*100.0*
Not costly to start or operate	22	55	25	51	18	53	23	16	8	8	96	183
	22.9	*30.1*	*26.0*	*27.9*	*18.8*	*29.0*	*24.0*	*8.7*	*8.3*	*4.4*	*100.0*	*100.0*
Tax regime	1	52	11	49	45	52	19	18	13	11	89	182
	1.1	*28.6*	*12.4*	*26.9*	*50.6*	*28.6*	*21.3*	*9.9*	*14.6*	*6.0*	*100.0*	*100.0*
Government support	8	45	2	44	27	37	18	35	36	25	91	186
	8.8	*24.2*	*2.2*	*23.7*	*29.7*	*19.9*	*19.8*	*18.8*	*39.6*	*13.4*	*100.0*	*100.0*
Existing infrastructure	8	46	4	75	21	27	34	23	29	15	96	186
	8.3	*24.7*	*4.2*	*40.3*	*21.9*	*14.5*	*35.4*	*12.4*	*30.2*	*8.1*	*100.0*	*100.0*
Access to finance	48	48	11	68	14	46	18	14	9	13	100	189
	48.0	*25.4*	*11.0*	*36.0*	*14.0*	*24.3*	*18.0*	*7.4*	*9.0*	*6.9*	*100.0*	*100.0*
Disengagement from place of work	16	32	9	79	13	40	29	14	24	16	91	181
	17.6	*17.7*	*9.9*	*43.6*	*14.3*	*22.1*	*31.9*	*7.7*	*26.4*	*8.8*	*100.0*	*100.0*
Income flows for old age	43	40	14	68	13	54	13	13	11	11	94	186
	45.7	*21.5*	*14.9*	*36.6*	*13.8*	*29.0*	*13.8*	*7.0*	*11.7*	*5.9*	*100.0*	*100.0*

Source: Author's computation

Note: Frequency distribution percentage(s) in italics.

Table 4.11: Opinion on factors affecting the formalisation of business

Factors	Excessive		Moderate		Low		Indifferent		Total	
	Lagos	**Kano**	**Lagos**	**Kano**	**Lagos**	**Kano**	**Lagos**	**Kano**	**Lagos**	**Kano**
Government regulations on taxes	76 *75.2*	97 *50.8*	9 *8.9*	57 *29.8*	5 *5.0*	24 *12.6*	11 *10.9*	13 *6.8*	105 *100*	191 *100*
Government regulations on minimum wage	52 *52.0*	39 *20.7*	16 *16.0*	92 *48.9*	9 *9.0*	37 *19.7*	23 *23.0*	20 *10.6*	100 *100*	188 *100*
Government regulation on business registration	41 *37.6*	63 *33.3*	26 *23.9*	64 *33.9*	34 *31.2*	46 *24.3*	8 *7.3*	16 *8.5*	109 *100*	189 *100*
Cost of entry into the formal sector	36 *36.4*	39 *20.5*	17 *17.2*	87 *45.8*	32 *32.3*	29 *15.3*	14 *14.1*	35 *18.4*	99 *100*	190 *100*
Corruption and bribery	133 *77.3*	95 *49.7*	15 *8.7*	51 *26.7*	8 *4.7*	19 *9.9*	16 *9.3*	26 *13.6*	172 *100*	191 *100*

Source: Author's Computation

Note: Frequency distribution percentage(s) in italics.

As observed in Table 4.11, the majority of the respondents in Lagos and Kano states considered government regulations on taxes, corruption, and bribery as being excessive and consequently affecting the formalisation of their businesses. In Lagos, all other factors, namely, government regulations; on minimum wages, business registration, and cost of entry into the formal sector were all considered excessive and therefore, obstacles to formalising their businesses. In contrast, these factors were considered moderate in Kano State.

Table 4.12: Opinion on economic and social factors affecting business

Factors	Substantially		Moderately		Slightly		Not at all		Total	
	Lagos	Kano	Lagos	Kano	Lagos	Kano	Lagos	Kano	Lagos	Kano
Importation policy	38 *40.4*	116 *62.7*	6 *6.4*	35 *18.9*	12 *12.8*	14 *7.6*	38 *40.4*	20 *10.8*	94 *100*	185 *100*
Macroeconomic policy:	29 *28.7*	59 *31.9*	20 *19.8*	58 *31.4*	14 *13.9*	46 *24.9*	38 *37.6*	22 *11.9*	105 *100*	185 *100*
Infrastructure	81 *66.9*	57 *30.6*	18 *14.9*	78 *41.9*	10 *8.3*	32 *17.2*	12 *9.9*	19 *10.2*	121 *100*	186 *100*
Security and crime	83 *63.8*	65 *35.7*	24 *18.5*	77 *42.3*	13 *10.0*	21 *11.5*	10 *7.7*	19 *10.4*	130 *100*	182 *100*
Political environment	63 *51.2*	72 *38.3*	30 *24.4*	58 *30.9*	15 *12.2*	20 *10.6*	15 *12.2*	38 *20.2*	123 *100*	188 *100*
Culture and tradition	45 *44.1*	65 *35.5*	19 *18.6*	59 *32.2*	21 *20.6*	16 *8.7*	17 *16.7*	43 *23.5*	102 *100*	183 *100*
Cashless policy	21 *19.6*	43 *23.1*	17 *15.9*	56 *30.1*	30 *28.0*	37 *9.9*	39 *36.4*	50 *26.9*	107 *100*	186 *100*

Source: Author's Computation

Note: Frequency distribution percentage(s) in italics.

Table 4.12 shows that both states exhibited similar majority responses to the effects of importation policy, political environment, culture, and tradition, which was considered substantial on their business activities. However, in Lagos State, there was a tie between those who felt that the importation policy affected their businesses substantially and those who felt it did not affect their businesses at all. This difference may arise from whether the input requirement of the business was imports dependent or not. In Lagos, infrastructure, security, and crime had a substantial impact on businesses, while in Kano, the impact of these factors is moderate. The cashless policy`s effect was moderate in Kano but it did not affect economic activities in Lagos State.

Table 4.13: Opinion on how businesses can be encouraged

	Lagos		Kano	
	Frequency	Valid per cent	Frequency	Valid per cent
Easy access to credit	25	21.9	22	30.6
Provision/improvement of Infrastructure	10	10.6	6	8.3
No harassment: More polite officials and stoppage of touts, landowners, Iyalojas	6	5.3	4	5.6
Reduce tax rates	5	4.4	1	1.4
Stop multiple taxation	4	3.5	-	-
Enactment of business-friendly laws	4	3.5	-	-
Control of inflation and input prices	3	2.6	-	-
Patronage of locally produced products/services	3	2.6	1	1.4
Maintenance of security	2	1.8	-	-
Reduction of bureaucracy	2	1.8	-	-
Reduce clearing fees at the port	2	1.8	-	-
Reduce interest rates	2	1.8	-	-
Stability of the exchange rate	2	1.8	-	-
Encouragement of persons with vocational certificates	1	0.9	-	-
Granting tax holidays to infant industries	1	0.9	-	-
Manufacturers should provide incentives	1	0.9	-	
Regulation of rent	1	.9	-	-
Boost agriculture	1	.9	-	-
Entrepreneurship education	1	.9	6	8.3
Construction of affordable modern markets	1	0.9	-	-
Ethnic bias	1	.9	-	-
Cheaper cost of production	1	.9	1	1.4
The government should boost demand	1	.9	-	-
Banning sub-standard products	1	.9	1	1.4
NA	31	27.2	16	22.2
Total	114	100.0	72	100.0

Source: Author's Computation

Table 4.13 tabulates the responses to an open-ended question on how business can be encouraged to thrive in Nigeria. Factors considered necessary in Lagos state by the respondents in order of importance is easy access to credit, provision, and improvement of infrastructure, less harassment, reduction of tax rates, halting multiple taxes and enactment of business-friendly laws. In Kano, the order of importance is easy access to credit, provision, and improvement of infrastructure, less harassment and entrepreneurial education. A high percentage of responses were not applicable because they were based on sentiments regarding participation in the business.

4.1.1.3 Size of the shadow economy

Based on the survey outcomes (see Table 4.14), the study obtained the average values of some indicators of the size of the SE as it pertained to the participants' responses. The category that gave the smallest size was concealment, suggesting that only a small percentage of those in the shadow economy participate in illegal activities. The category that gave the largest size of the shadow economy was the cash-based system of payment, which placed the estimates at 91 per cent. This shows that cash was a predominant means of payment and therefore hid the trail of activities in the shadow economy. In order of relative importance, the magnitude of the size of the SE in descending order is a cash-based system, incomplete records keeping, non-registration, no employment contract, access to employment benefits, keeping of business accounts, non-payment of taxes and concealment. It is important to note, that there is no uniform estimate of the shadow economy because different methodologies were applied.

Table 4.14: Summary of estimates of the shadow economy from survey outcomes

Dimensions	Estimate (%)*
Incomplete records	89.75
No business accounts	75.40
The cash-based system of payment	91.00
Concealment	22.60
No employment contract	88.75
No access to employment benefits	79.30
Registration	84.50
Non-payment of taxes	46.00

Source: Author's Computation

Note: * The estimates are simple averages pertaining to the survey outcomes

4.1.1.4 Perceived effects of the shadow economy

The effects of the shadow economy are evaluated in this section. According to Table 4.15, the respondents in Lagos state believed that their businesses had an average impact on income generation and job creation, this is followed by the belief, the impact is high. In the case of poverty reduction, the majority perceived that SE had a high impact on the economy, which is closely followed by respondents that were of the view that their businesses had an average impact. About 34 per cent of the respondents stated that the impact of the SE on the production of goods and services was low, but this was closely followed by about 32 per cent that perceived the impact to be high. As regards, exports and foreign exchange earnings, about 46 per cent and 32 per cent of the respondents believed that the impact was low and nil respectively. In respect of tax revenue generated, an overwhelming majority were of the view that the impact was high. The perceptions of the effects of SE activities on selected macroeconomic variables are presented in Table 4.15.

Table 4.15: Perceptions of the effects of shadow economic activities on some selected macroeconomic variables in Lagos state

Variables	High impact	Average impact	Low impact	No impact	Negative impact	Total
Income generation	55 *37.9*	61 *42.1*	28 *19.3*	1 *0.7*	-	145 *100.0*
Job creation	45 *33.6*	55 *41.0*	28 *20.9*	4 *3.0*	2 *1.5*	134 *100.0*
Poverty reduction	59 *42.8*	49 *35.5*	24 *17.4*	5 *3.6*	1 *0.7*	138 *100.0*
Production of goods and Service	30 *31.6*	18 *18.9*	32 *33.7*	15 *15.8*	-	95 *100.0*
Exports/foreign exchange earning	7 *7.5*	11 *11.8*	43 *46.2*	30 *32.3*	2 *2.2*	93 *100.0*
Tax revenue generation	86 *61.4*	19 *13.6*	23 *16.4*	8 *5.7*	4 *1.9*	140 *100.0*

Source: Author's Computation

Note: Frequency distribution percentage(s) in italics.

Table 4.16: Perceptions of the effects of shadow economic activities on some selected macroeconomic variables in Kano state

Variables	High impact		Average impact		Low impact		No impact		Negative impact		Total	
Income generation	101	*54.6*	49	*26.5*	15	*8.1*	13	*7.0*	7	*3.8*	185	*100.0*
Job creation	57	*31.3*	76	*41.8*	21	*11.5*	18	*9.9*	10	*5.5*	182	*100.0*
Poverty reduction	83	*45.9*	47	*26.0*	23	*12.7*	16	*8.8*	12	*6.6*	181	*100.0*
Production of goods and service	53	*29.0*	68	*37.2*	34	*18.6*	23	*12.6*	5	*2.7*	183	*100.0*
Exports/foreign exchange earning	35	*19.4*	54	*30.0*	56	*31.1*	29	*16.1*	6	*3.3*	180	*100.0*
Tax revenue generation	72	*39.1*	46	*25.0*	27	*14.7*	31	*16.8*	8	*4.3*	184	*100.0*

Source: Author's Computation
Note: Frequency distribution percentage(s) in italics.

As seen in Table 4.16, more respondents were of the opinion that their businesses had a high impact on income generation, poverty reduction, and tax revenue generation. The impact was considered average in respect to job creation, and production of goods and services, while for exports and foreign exchange earnings, the impact was low. Similarities are observed in both states in respect of the impact of the shadow economy on job creation, poverty reduction, exports and foreign exchange earnings and tax revenue generation.

4.1.2 Micro dimensions of SE based on probit results

In a bid to provide more insight into the determinants of the micro dimensions of the shadow economy, this section assesses the shadow economy using a simple probit regression analysis. The probit model estimates are interpreted using the marginal effects. The result satisfies the first objective and is presented in Table 4.17.

Table 4.17: Determinants of the shadow economy using marginal effects at the means

	Incomplete Records	Cash-based transactions	Non-registration	Concealment	Harassment
Gender (reference variable: female)					
Male	.003(.028)	-.064**(.030)	-.018(.040)	-.046(.071)	-.057(.047)
Age (reference variable: over 64 years)					
15-24years	.032(.052)	.100(.165)	163(.288)	-.181(.400)	-.018(.096)
25-34years	.028(.047)	.117(.163)	.128(.284)	-.060(.394)	-.028(.084)
35-44years	.017(.046)	.069(.162)	.121(.284)	.064(.395)	-.079(.084)
45-64years	-	.106(.161)	.209(.284)	-.373(.397)	-
Marital status (reference variable: widowed)					
Single	.014(.069)	-.009(.086)	.028 (.125)	.173 (.211)	-.125 (.115)
Married	.080(.072)	-.009(.083)	.011 (.120)	-.050(.200)	-.108 (.107)
Separated/divorced	.069(.096)	.072(.116)	.333*(.195)	-.312(.262)	.183 (.142)
Education (reference variable: tertiary)					
no_formal_education	-	.147*(.085)	.240* (.133)	.654***(.180)	-.181* (.097)
primary	-	.031 (.036)	.214***(.078)	.284***(.104)	-.102 (.069)
secondary	.050*(.026)	.044 (.027)	.071* (.039)	.064 (.079)	-.113**(.053)
vocational_technical	-.030 (.038)	-.029 (.048)	-.082 (.062)	.369** (.149)	.034 (.089)
Ownership status of business (reference variable: others)					
sole_proprietorship	-.034 (.048)	.078*(.044)	-.075 (.102)	-.380** (.157)	-.008 (.094)
partnership	-.084 (.061)	.032 (.052)	-.135 (.111)	-.223 (.188)	.101 (.114)
family_owned	-.080 (.058)	.040 (.496)	-.154 (.107)	-.414** (.179)	.012 (.112)
cooperative	-.058 (.073)	-	-	-.248 (.276)	-.010(.172)
registered enterprise/company	-.125*(.072)	.007 (.063)	-.311**(.124)	-.746***(.269)	.030 (.139)
Finance (reference variable: others)					
Bank loan	-	-.245***(.093)	-.115(.135)	.744*(.357)	.357**(.169)
Microfinance loan	-.102**(.051)	-.123** (.059)	-.124(.078)	.380*(.165)	.028 (.116)
Association	-.064 (.054)	-.145* (.058)	.074(.082)	.256 (.150)	.175* (.095)
Informal savings	-.013 (.045)	-.060 (.051)	-.070(.063)	.209 (.114)	.093 (.078)
Moneylenders	-	-.146 (.103)	-	-	-.102 (.212)
Friends	-.010 (.050)	-.121** (.053)	.037(.081)	-.034 (.140)	.028 (.092)
Abroad	-.104 (.070)	-.142 (.087)	-.098(.136)	.278 (.294)	.378**(.188)
Personal saving	-.033 (.038)	-.097 (.045)	-.016(.061)	.299**(.104)	-.024 (.074)
Govt./NGO	-	-	-	-	.412**(.201)
Response to a proposed tax increase (tax morale) (reference variable: oppose)					
Support	.014(.023)	.017(.028)	.022(.042)	-.311***(.078)	-.038 (.053)
Indifferent	.019(.024)	.029(.025)	.002(.039)	-.128 (.070)	.081*(.047)
Income (reference variable: ₦1,000,001 and above)					
Less than ₦30,000	.043 (.037)	.047(.044)	.243***(.066)	-.156**(**.159**)**	.064 (.116)
₦30,001 to 50,000	-.016(.041)	.037(.050)	.115 (.076)	-.116(.171)	.108 (.122)
₦50,001 to 100,000	.040 (.045)	.056(.053)	.108 (.077)	-.263(.179)	-.039(.132)
₦100,001 to 500,000	.033 (.074)	-.054(.070)	-.032 (.102)	-.136(.246)	.159 (.161)
₦500,001 to1000000	-.030(.071)	-	.059 (.127)	.265 (.337)	.115 (.208)

Hours worked (reference variable: over 40 hours)					
Less than 20 hours	.083** (.041)	.075(.039)	.117** (.058)	-.090 (.117)	-.251***(.082)
20 to 35 hours	.084** (.033)	.019(.026)	.186***(.045)	.103 (.082)	-.118** (.054)
36 to 40 hours	.129***(.043)	.101***(.034)	.076 (.046)	.170**(.082)	-.164***(.056)
Pseudo R^2	0.340	0.283	0.314	0.241	0.181
Log likelihood	-75.085	-103.509	-118.965	-212.099	-167.422
LR chi^2	77.28***	81.51****	109.09***	134.36***	74.14***
No of observations	313	396	396	403	407

Source: Source: Author's Computation

Note: Estimated coefficients are given with standard errors in parentheses.

* $p<.05$, ** $p<.01$, *** $p<.001$

Table 4.17 presents the marginal effects at the means using the Delta method. It indicates the likelihood of taking part in the SE, given the reference category. From Table 4.17, the statistics of interest for interpretation include the likelihood ratio, the coefficients,[20] the level of significance, and the Pseudo R^2. The intercept is not significant in any of the models. The pseudo R^2 showed that the explanatory variables explain about 34 per cent, 28 per cent, 31 per cent, 24 per cent, and 18 per cent of the variation in the indicator variables. Also, the Log-likelihood ranged from -75.085 to -212.099. The factors responsible for each dimension of the SE are examined.

Incomplete records

Participants who do not keep any formal accounting records characterise the shadow economy. Variables that significantly affect records keeping as an indicator of the shadow economy are secondary school education, registered businesses, microfinance loans, and hours of work (less than 20 hours, 20 to 35 hours, and 36 to 40 hours). Results show that completing secondary school is associated with a 5 per cent higher probability of not keeping formal records of transactions, which is an indicator of the shadow economy. Secondary education contributes positively and significantly to not keeping, accounting records of business transactions. This is linked to the incidence of short-lived business due to the age profile (youths) of the participants and the fact that they can further their education and thereafter get a better job. Therefore, they see no reason to keep records. Other categories of educational attainment are not significantly related to records keeping.

On the other hand, the motivation to participate in SE activities is less pronounced for those operating a registered company and those having access to loans from microfinance banks. This is because these factors have a significant impact on reducing the shadow economy by about 13 per cent, and 10 per cent, respectively. This is due to the formalities associated with operating a formally registered firm and obtaining a loan. This is the case, because, records are kept in the normal course of business to meet up with regulatory requirements. Loan applications involve some level of formality to reduce the incidence of risk associated with advancing loans by the bank. The number of hours worked has a positive and significant impact on records keeping. This suggests that the hours worked predisposes the respondents to deviate from keeping

[20]The coefficients are interpreted in terms of the level of significance and the expected signs.

records. Respondents who work less than 20 hours, 20 to 35 hours and between 36 to 40 hours are the ones in this category. Working for less than 20 hours, 35 to 40 hours and 36 to 40 hours, while controlling for other factors increase the probability of participating in the shadow economy through the records channel by 8 per cent, 8 per cent, and 13 per cent.

On the other hand, age, marital status, tax morale, and income earned have no significant impact on the indicator. In addition, the relationship between tax morale and participation in the shadow economy is not consistent with the negative findings by Torgler and Schneider (2007). The Pseudo R^2 shows that the explanatory variables explain about 34% of the variation in the records keeping dimension of the shadow economy.

Cash-based transactions

This dimension of the SE is observed against the background that most transactions are carried out using cash in the shadow economy (Schneider and Enste, 2000). The variables that significantly and positively influence the use of cash are when the participants have no formal education, are secondary school leavers, are sole-proprietors and work between 36 to 40 hours. On the other hand, the probit regression suggests that being a male, obtaining credit by way of bank loan, microfinance bank loan, association loan and loan from friends negatively affect this cash channel in a significant manner.

A further breakdown shows that being a male reduces the likelihood of using cash as a payment channel. This may be attributed to the fact that they dominate the sample selected for this work and are exposed to the various financial products available. Having no access to education and obtaining a secondary school education increases the chance of using cash for business transactions.

The ownership structure of the business is of importance as to whether cash dominates or otherwise. The results suggest that a sole proprietorship and registered businesses are prone to using cash. This may be connected with the fact that a significant number of businesses are involved in trading activities, which is mainly cash-based.

In the source of 'finance' category, most of the subcategories had a negative and significant relationship with cash. In particular, the significant sources of funding are a bank loan, microfinance loan, a loan from the association, a loan from friends and remittances from abroad. Access to these sources reduces the need for a cash transaction. However, informal savings, moneylenders, and personal savings have no significant impact on the cash channel.

Hours of work predispose an individual for using the cash channel. In particular, working between 36 to 40 hours of work weekly has a positive relationship with utilising cash. This suggests that underemployment predisposes the respondents to use cash because it is a liquid form of money. The following variables have no significant impact on the usage of cash, and include age, marital status, tax morale, and income.

With regards to using cash as the main payment channel, there is about 6 per cent, 25 per cent, 12 per cent, 15 per cent and 12 per cent possibility that the individual would be a male; have access to a loan from the bank, microfinance bank, association and friends. The effect of these variables significantly reduces the participation of individuals in the shadow economy. If an individual has no access to formal education, is a sole proprietor and works 36 to 40 hours weekly, it increases the probability of participation in the shadow economy by about 15 per cent, 8 per cent and 10 per cent respectively.

Non - registration

This study focused on microenterprises identified to be the largest pool for shadow economy activities. A large number are not registered with the government and therefore, do not have to comply with any regulations (De Soto, 1989). Hence, they do not benefit from any government assistance targeted at registered businesses. The decision not to register one's business is influenced positively and significantly by the following factors; being a separated/ divorced individual, the level of education (no formal education, primary, secondary education), earning less than ₦30,000, working less than 20 hours to 35 hours of work weekly (underemployment). The fact that a registered business has a negative but significant impact on the decision not to register is interesting because once registered; the business owners are less concerned about other regulations to be adhered to.

These results are explained in details as follows; earning below ₦30,000 makes a participant in the shadow economy reluctant to register their business. This is expected as results from the survey conducted showed that the majority of the respondents view their size in terms of income as being an important constraint on registering their business.

It also appears that the level of education is also a major determinant of the decision not to register. This may be due to lack of information or poor awareness of the benefits of registering a business. A factor connected with the hours of work is the fact that the significant sub-categories indicate the fact that underemployment is a significant disincentive to registering a business.

Individuals who have no formal education, and have completed secondary school have about 24 per cent and 7 per cent chance of avoiding registration. Regarding income generated from the shadow business, it is observed from the survey that the majority earn less than ₦30,000, and this increases the likelihood of non-registration of business by about 24 per cent. Hours of work used to run the business, specifically, working less than 20 hours and working between 20 to 35 hours increases the probability of avoiding registration by about 12 and 19 per cent. On the other hand, operating as a registered company reduces the chance of non-registration as a critical characteristic of being in the shadow economy by about 31 per cent.

Concealment

The inclusion of this indicator captures illegal and criminal activities. It captures the hidden nature of the shadow economy and brings up exciting results. For instance, not having a formal education, having a primary, secondary school and vocational education, using personal savings as a source of credit and working between 36 and 40 hours predisposes a shadow economy participant to conceal premises and goods if news of a government inspection is received. Even more impressive is the fact that a registered business will also conceal certain activities because they have regulations to abide by, and if sanctioned, they stand to lose heavily. If the benefit of concealment outweighs the cost of the penalty, it is rational for the business to conceal its activities.

Being a sole proprietor, running a family-owned business and supporting a tax increase, negatively and significantly affect the decision to conceal one's activities.

Family businesses are operated in connection with close family members and associates who would not want to lose their means of livelihood, so they would instead do things right or connive together concerning concealment. The same goes for a sole proprietor.

Supporting a tax increase for the good of the public is an indication of high tax morale, and such a person is unlikely to engage in illegal activities (Torgler and Schneider, 2007). It should be emphasised that high tax morale reduces the incidence of concealment. The results in Table 4.17 reveal that factors such as gender, age, marital status, and income are not significant in determining concealment.

The likelihood of concealment is increased when the participant has no formal education, has completed primary education and vocational training with the probability of participation in this shadow economy activity being about 65 per cent, 28 per cent and 37 per cent respectively. It is important to note that in this education category, having no formal education is the category with the highest probability determining this indicator.

Specifically, concerning the sources of finance, access to a bank loan, microfinance bank loan and personal savings increases the chances that business premises and goods are concealed by 74 per cent, 38 per cent and 30 per cent. This is connected with measures put in place to avoid re-payment of loans and to disguise the exact turnover profile of the business. Observations from the fieldwork conducted indicate that the value of goods in some stores did not coincide with the capital said to be invested in the business. Furthermore, underemployment, which is captured by those working between 36 to 40 hours show that 17 per cent of the changes in concealment, is accounted for.

Harassment

Harassment is a result of being in the shadow economy (De Soto, 1989). It is not related to political affiliations but is purely economic in nature. Time spent running the business, and having a secondary education is inversely related to harassment by government officials. This arises from the fact that underemployment may cause the respondent to transact business at their convenience; hence, they can escape harassment.

Furthermore, not having a formal education, obtaining credit from the bank, association, remittances from abroad, and the government or NGO in addition to being

indifferent to an increase in taxes, all contribute positively and significantly to being harassed. Indifference to taxes, which is an indicator of tax morale, may predispose a participant to embarrassment. From the interview carried out in Lagos state, many respondents were harassed by government officials due to non-payment of taxes

Obtaining a bank loan, association loan, government support and remittances from abroad, being indifferent to a proposed tax increase predispose a participant to harassment with a probability of 36 per cent, 18 per cent, 41 per cent, 38 per cent and 8 per cent respectively. On the other hand, having no formal education, having a secondary school education, working less than 20 hours, 20 to 35 hours and 36 to 40 hours reduces the probability of harassment by about 18 per cent, 11 per cent, 25 per cent, 12 per cent and 16 per cent respectively. Gender, age, marital status, ownership status, and size of the economic unit do not influence this dimension.

On the overall, the results obtained indicate that there is a weak and insignificant association between age and the various indicators of the shadow economy. Another measure for the shadow economy used in this work is access to social security of which pension contributed by the business owner in respect of employees was used to take care of social security contributions as a labour force regulation. However, the probit regression was not maximised. Therefore it was dropped. The pseudo-R^2 reveals that about 34 per cent, 28 per cent, 31 per cent, 24 per cent and 18 per cent of the variation in the indicator variables are accounted for by the explanatory variables. In summary, the factors determining the shadow economy varied across different definitions of the phenomenon.

4.2 Macroeconomic-based results on the incentives for participation and size of the shadow economy

4.2.1 MIMIC model results

The summary statistics of the variables used in the MIMIC model are presented in Table 4.18. All the statistics are within reasonable bounds.

Table 4.18: Summary statistics of variables used in the MIMIC model

Variable	Mean	Standard deviation	Minimum	Maximum
Labour force participation rate	55.98	0.69	54.8	57.00
M0/M1	0.39	0.11	0.15	0.55
GDP growth rate	4.45	7.99	-13.13	33.74
Tax revenue (% of GDP)	2.78	1.56	0.91	5.46
Unemployment	8.32	5.29	1.8	23.9
Government consumption (% of GDP)	9.54	3.57	4.83	17.94
Inflation	18.92	16.33	3.46	72.84

Source: Author's computation

Table 4.19: MIMIC model estimation results of the shadow economy of Nigeria

Causal variables	Coefficients	z-statistics
Tax revenue (% of GDP)	5.481**	(3.36)
Unemployment rate (%)	0.498	(1.22)
Government consumption (% of GDP)	0.570	(0.58)
Inflation	2.033**	(5.36)
Indicator variables		
M0/M1	0.001	(0.25)
GDP (annual percentage growth)	-0.794***	(3.41)
Labor Participation rate	1.00	
Statistical tests		
Chi-square [*p*-value]	199.282	(0.000)
Coefficient of determination	0.614	
Number of observations	45	

Source: Author's computation

Note: ***, **, * denote significance at the 1, 5, and 10% significance levels.

Table 4.19 displays the estimated coefficients from the MIMIC model. The result reveals that tax revenue and inflation are significant at the five per cent level of significance. On the other hand, the unemployment rate and government consumption are not significant. Theoretically, the signs associated with the variables are in line with economic theory. An increase in the level of taxes and inflation is associated with an increase in the incidence of the shadow economy (Schneider et al. 2010; Loayza, 1997). A per cent increase in the size of taxes and inflation is linked with about 548 per cent and 203 per cent increase in the shadow economy. Such magnitude of a causal relationship between taxes, inflation and the shadow economy indicates the extent to which both drive growth in the shadow economy. Taxes are viewed as an obstacle to formalising business while, inflation, which is a gauge of the health of the economy also is a culprit in the growth of the shadow economy. This result confirms those obtained from the fieldwork where high taxes and the poor state of the economy were seen as factors accounting for the incidence and continued existence of the shadow economy.

The labour participation rate was fixed to 1.00, indicating the fact that a higher labour participation rate is associated with a higher incidence of persons participating in the shadow economy. This is in line with theoretical considerations. As an indicator of the shadow economy, the GDP growth rate is negatively, and significantly related to the shadow economy in line with the conclusions reached by Loayza (1997), while the currency variable is not significant.

The coefficient of determination (CD) suggests that 61.4 per cent of the variation in the shadow economy is accounted for by the variables in the model. This indicates a good fit.

4.2.2 Currency demand results

4.2.2.1 Descriptive statistics

The statistical properties of the annual time series data used in the currency demand regression are presented in Table 4.20. Information about the mean, median, standard deviation, skewness and Jarque-Bera statistics of each variable are shown. The results show that the series is normally distributed. The mean values of the natural log real GDP (Y), real interest rate (R), inflation rate (π), ratio of tax revenue to GDP (T), financial innovation (F), and real currency in circulation (C) were 11.92, 3.85, 1.58,

-3.46, 7.74 and 9.00 respectively. The standard deviation of these series was also within reasonable bounds. Furthermore, the skewness showed that the variances of the variables are not large while the Jarque-Bera statistics was also reasonable. Each of the variables had 46 observations.

Table 4.20: Summary statistics of variables in the currency demand model

	Y	R	π	T	F	C
Mean	11.92	3.85	1.58	-3.46	7.74	9.00
Median	11.69	4.06	1.61	-3.27	7.68	9.04
Maximum	13.33	4.27	4.98	-2.78	10.35	9.59
Minimum	11.28	-0.41	-2.30	-5.16	5.61	8.11
Std. Dev.	0.59	0.72	2.50	0.58	1.37	0.39
Skewness	1.28	-4.77	-0.10	-1.73	0.53	-0.59
Kurtosis	3.47	28.18	1.48	5.20	2.41	2.64
Jarque-Bera	13.02	1389.10	4.53	32.29	2.80	2.93
Probability	0.00	0.00	0.10	0.00	0.25	0.23
Observations	46	46	46	46	46	46

Source: Author's computation

4.2.2.2 Stationarity tests

The Augmented Dickey-Fuller (ADF) tests showed that all series which includes real GDP (Y), inflation rate ($\boldsymbol{\pi}$), tax (T), financial innovation (F) and currency in circulation (C), were integrated of order one except for the interest rate (R) which was stationary at levels.

Table 4.21: Augmented Dickey-Fuller Test Results

Variable	Levels	First difference	Order of integration
Y	-1.97	-3.42**	I(1)
R	-4.76***	-	I(0)
π	-1.00	-3.16****	I(1)
T	-2.26	-4.89*****	I(1)
F	-0.16	-3.59*****	I(1)
C	-2.77	-4.99***	I(1)

Source: Author's computation

Notes: *** - 1 per cent significance level

** - 5 per cent significance level

4.2.2.3 Estimate of the shadow economy from the currency demand model

The currency demand model results in Table 4.22 were inspected to check if the incentive variable (tax) is positively signed and significant. The incentive variable, which is tax (T), indicates that a 1 per cent increase in taxes is associated with about 59 per cent increase in currency in circulation (C). This positive relationship is consistent with the findings by Faal (2003), Ariyo, and William (2011). The signs of coefficients associated with the real GDP (Y), tax (T), real interest rate (R) and inflation rate (π) meet theoretical expectations. However, financial innovation (F) showed a positive relationship with money in circulation (C), suggesting the fact that it increased money in circulation rather than reduced it.

The coefficient of determination (R^2) showed that 77 per cent of the variation in currency demand (C) was explained by the independent variables in the model. In addition, the diagnostic tests showed the absence of heteroscedasticity, and serial correlation.

Table 4.22: Currency demand model result

Dependent variable: lnC

Causal variables	coefficients	t-statistics
β_0	2.833**	(2.029)
lnY	0.495***	(3.263)
lnT	0.589***	(4.339)
lnR	-0.012	(-0.265)
Inπ	-0.010	(-0.291)
lnF	0.308***	(3.646)
R^2	0.770	

Diagnostic Tests		
	F-statistic	**Probability**
ARCH heteroscedasticity	0.017	0.134
Breusch-Godfrey serial correlation LM test	0.211	0.161
Jarque-Bera test	0.852	0.787
Ramsey reset test	1.259	0.247

Source: Author's computation
Note: t-statistics in parenthesis
***, **, * denote significance at the 1, 5, and 10% significance levels.

4.2.3 Size of the shadow economy

The insignificant variables from the model estimated in Table 4.22 were dropped. The fitted values of the estimates of the currency model with and without tax were extracted in order to obtain the shadow economy estimate, which was combined with the MIMIC index to obtain the size of the shadow economy. The outcomes of the currency demand model were combined with the MIMIC factor scores to derive the shadow economy as a percentage of GDP for selected years. The results are shown in Table 4.23.

Table 4.23: Estimates of the size of the shadow economy

Year	MIMIC factor Score	Currency demand estimates	Shadow economy (% of GDP)
1970	37.467		41.831
1971	47.067		52.552
1972	56.383		62.950
1973	54.691		61.061
1974	49.438		55.196
1975	64.609	59.196	72.135
1976	51.622		57.635
1977	54.122		60.426
1978	64.846		72.398
1979	53.424		59.647
1980	55.589	76.007	62.063
1981	72.460		80.900
1982	62.558		69.844
1983	66.134		73.837
1984	62.521		69.803
1985	53.442		59.667
1986	67.561		75.430
1987	67.185		75.010
1988	53.163		59.355
1989	52.892		59.053
1990	52.101	55.147	58.169
1991	56.642		63.239
1992	56.791		63.406
1993	56.442		63.016
1994	58.759		65.603
1995	58.264		65.050
1996	55.627		62.106
1997	56.773		63.386
1998	56.870		63.493
1999	56.327		62.888
2000	54.774	51.211	61.154
2001	55.007		61.414
2002	54.773		61.153
2003	51.057		57.004
2004	43.655		48.740
2005	56.639	61.836	63.236
2006	49.848		55.654
2007	51.464		57.458
2008	57.371		64.053
2009	57.501		64.198
2010	54.068	66.813	60.365
2011	54.439		60.780

2012	51.764		57.794
2013	54.359		60.690
2014	54.149	44.150	60.456
2015	55.419		61.87

Source: Author's computation

The currency demand estimates were combined with the MIMIC factor scores to obtain the shadow economy as a percentage of the GDP (see column three of Table 4.23). The estimates satisfy the second objective of this study. The size in 1970 was 41.8 per cent, and it rose gradually to 62.95 per cent in 1972. This period tallied with the first oil boom experienced by the country, which drew persons from rural areas to the booming urban areas. The migrants assumed they would obtain better-paying jobs, which in most cases did not materialise. Thereafter the size fell to 55.20 per cent in 1974 before rising sharply to 72.40 per cent in 1978. This incidence occurred in the aftermath of the nationalisation policy and mass downsizing of the workforce in the public sector, which caused a massive influx of unemployed workers into the labour market. In 1981, the size of the SE peaked at 80.9 per cent. This was the year of the international oil glut and global financial crisis (recession) which culminated in the inability of the government to meet up with its obligations. A period of mixed fortunes followed, and by 1986, the size had risen to 75.43 per cent of the economy. This period was characterised by a significant restructuring of the economy from a heavily regulated one to that which was liberalised and deregulated. This was in reaction to the country's inability to act proactively to international shocks, in particular, oil price shocks. The aim was to encourage the private sector to become the engine of growth as well as diversify the economy. Since 1988, the size of the shadow economy has not risen beyond 65.60 per cent of the GDP. The lowest size of 48.74 was recorded in 2004, which was a period of prosperity for the country and a period of implementation of growth-enhancing policies such as the National Economic Empowerment Development Strategy (NEEDS). This result from the MIMIC model tallies with the trend in SE generated for Nigeria by Ariyo and William (2011), Medina, and Schneider (2018).

This study proceeds to compare the results of the size of the shadow economy with those obtained from the survey carried out. The results are presented for the year 2014, which is a common time factor connecting both the survey and macro-based results. The results are presented in Table 4.24.

Table 4.24: Summary of estimates of the shadow economy as of 2014

Method of analysis	**Estimate (%)**
MIMIC model	60.46
Currency demand model	44.15
Survey outcomes*	
Incomplete records	89.75
No keeping of business accounts	75.40
The cash-based system of payment	91.00
Concealment	22.60
No employment contract	88.75
No access to employment benefits	79.30
No registration	84.50
Non-payment of taxes	46.00

Source: Author's computation
Note: * The estimates are averages pertaining to the survey outcomes

The MIMIC estimates place the size of the shadow economy at approximately 60.46% of GDP in 2014, while that of the currency demand model was 44.15 per cent. Based on the survey outcomes, the study obtained the average values of some indicators of the size of the shadow economy as it pertained to the participant's responses. The category that gave the smallest size of the shadow economy was concealment suggesting that only a small percentage of those in the shadow economy participated in illegal activities. The category that gave the largest size is the cash-based system of payment, which placed the size at 91 per cent. This result revealed that cash was a predominant means of payment, and therefore hid the trail of activities in the shadow economy. In order of relative importance, the magnitude of the size of the shadow economy in descending order was a cash-based system, incomplete records keeping, non-registration, no employment contract, access to employment benefits, no business accounts, non-payment of taxes, and concealment. It is important to note that there is no uniform estimate of the shadow economy because different methodologies were applied.

Matters arising from the determination of the size of various dimensions of SE

The macroeconomic estimates of the size of the MIMIC model and currency demand model were generally lower than that obtained from the survey results. These estimates helped highlight the leading indicators of the shadow economy for policy intervention. The results should be treated with caution as survey results are compared with macroeconomic results. Besides, the survey was discriminatory as it focussed on the informal sector while the macroeconomic estimates did not distinguish between the various definitions of the shadow economy.

4.3 Effects of the shadow economy on economic growth

4.3.1 Descriptive statistics

The statistical properties of variables used in the growth regression are presented in Table 4.25. The summary statistics provide information on the natural logs of the variables of interest.[21] The statistics of interest include the mean, standard deviation, minimum, and maximum values, respectively. The results suggest that the series is normally distributed and are within reasonable bounds.

[21] The summary statistics are estimated using the natural log values of the variables.

Table 4.25: Summary statistics of variables used in the growth model

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Y	46	9.114	2.668	5.199	13.221
L	46	1.281	.871	-0.307	2.242
K	46	2.455	.366	1.699	3.527
SE	46	3.989	.113	3.596	4.256
OPEN	46	-0.603	0.459	-1.555	0.239

Source: Author's computation

4.3.2 Stationarity Tests

This involves testing the time-series properties of the variables of interest in the growth model to avoid the incidence of spurious results arising from using non-stationary series. Only the Augmented Dickey-Fuller (ADF) tests were employed for this purpose as results do not vary significantly across different methods. The stationarity tests reveal that SE (shadow economy per cent of GDP) is stationary at levels. This suggests that SE is stationary at levels and therefore, the null hypothesis of the presence of a unit root is rejected. On the other hand, capital stock (K), human capital (L), openness (OPEN), trend GDP (TGDP) and real GDP per capita (Y) are stationary after first differencing and are integrated of order one.

The error correction term (ECM) which is the residual component obtained from regressing the I(1) variables was integrated of order zero. This result gives an indication of a linear combination of the variables in the model. On this basis, an error correction model can be estimated to determine the effects of SE on economic growth.

The results of the stationarity tests are presented in Table 4.26.

Table 4.26: Augmented Dickey-Fuller test results

Variable	Levels	First difference	Order of integration
Y	0.028	-6.114***	I(1)
SE	-5.882***	9.671***	I(0)
L	-1.315	-6.723***	I(1)
K	-2.331	-6.306***	I(1)
OPEN	-2.37	-9.34***	I(1)
TGDP	-2.084	-6.391***	I(1)
ECM	-4.706***	-	I(0)

Source: Author's computation
Notes: *** - 1 per cent significance level
** - 5 per cent significance level

4.3.3 Cointegration tests

The coexistence of *I(0)* and *I(1)* variables make it necessary to test whether a long-run relationship exists between the *I(1)* variables in the model. The Engle-Granger cointegration test confirmed the existence of cointegration given the stationarity at levels of the residual obtained from the regression model. This outcome is confirmed by applying the Johansen cointegration test to the *I(1)* variables in the growth model. The test is concerned with whether a long-run relationship exists between the variables in the growth model. The test results are shown in Table 4.27. The results suggest that the *I(1)* variables in the growth model are cointegrated. The trace statistics shows that the maximum rank is one and there exists one cointegrating equation. On this basis, it can be deduced that there exists a cointegrating relationship. Therefore, the parsimonious error correction growth model can be estimated.

Table 4.27: Johansen test for cointegration

Hypothesized No. of CE(s)	Eigenvalue	Trace statistic	0.05 Critical value	Prob. **
None*	0.495	74.462	69.819	0.020
At most 1	0.433	44.427	47.856	0.101
At most 2	0.268	19.483	29.797	0.459
At most 3	0.100	5.773	15.495	0.722
At most 4	0.026	1.141	3.841	0.285

Source: Author‘s computation

Note: 1. Trace test indicates 1 cointegrating equation at the 0.05 level
2. *denotes rejection of the hypothesis at the 0.05 level
3. ** represents Mackinnon-Haug-Michelis (1999) p-values

4.3.4 Parsimonious error correction growth model

Based on the confirmation of cointegration, an error correction model incorporating both the short-run and long-run dynamics of the system of equations can be estimated. The model is first run using four (4) lags of each variable. After that, insignificant variables were eliminated as long as it improved the overall results.

The effects of the shadow economy (SE) on economic growth were significant in the short run, but this occurred with the wrong sign. This result suggests that the SE contributes positively to the economy and its potential can be exploited for the general benefit of the Nigerian economy. Further analysis of the results shows that a one per cent increase in the current size of SE as a percentage of GDP leads to about 66 per cent increase (β=0.655) in the growth of the economy. However, the first lag of SE (percentage of GDP) shows that the contribution of SE to economic growth falls to about 60 per cent. In the second and fourth lagged period, it falls further to about 55 per cent and 26 per cent respectively. This outcome suggests that the effect of SE on economic growth is more effective in the current year and that its effects, which gradually decline over time, are not statistically significant. This phenomenon shows the gradual formalisation of SE activities or its inability to survive in a harsh economy, which is characterised by high mortality rates of micro and small-scale enterprises' activities. Openness (OPEN) is positively and statistically significant in determining economic growth (β=0.454). Likewise, technology, which is represented by trended nominal GDP (TGDP) is also statistically significant in influencing economic growth (β=0.046). The coefficients of GDP per capita (Y), capital (K) and Human capital (L) were not statistically significant.

The error correction term (ECM(-1)) which had the correct sign but was insignificant reveals that shocks to the system were not easily dissipated suggesting the speed of adjustment between the short-run dynamics and long-run equilibrium was very slow. The results (β=-0.026) suggest that drastic policy intervention is needed to rescue the SE from shocks emanating from the economy. The coefficient of determination (R^2) indicates that the independent variables explain about 71 per cent of the variation in the dependent variable (Y).

The results of the parsimonious error correction model are presented in Table 4.28.

Table 4.28: Parsimonious error correction growth model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.091	0.501	-2.179	0.041
D(Y(-1))	0.124	0.195	0.634	0.533
D(Y(-2))	0.170	0.166	1.025	0.317
D(Y(-4))	-0.290	0.187	-1.545	0.137
D(K(-2))	-0.015	0.034	-0.441	0.664
D(K(-3))	-0.016	0.035	-0.452	0.656
D(K(-4))	-0.006	0.030	-0.189	0.852
D(L)	0.259	0.188	1.377	0.183
D(L(-2))	-0.147	0.175	-0.841	0.410
D(L(-3))	-0.302	0.175	-1.727	0.099
D(L(-4))	-0.147	0.192	-0.764	0.453
SE	0.655	0.315	2.081	0.050
SE(-1)	0.603	0.303	1.989	0.060
SE(-2)	0.546	0.298	1.829	0.082
SE(-4)	0.259	0.219	1.185	0.249
D(OPEN)	0.454	0.078	5.782	0.000
D(OPEN(-1))	0.211	0.116	1.819	0.083
D(OPEN(-4))	0.146	0.096	1.513	0.145
TGDP	0.046	0.018	2.563	0.018
ECM(-1)	-0.026	0.004	-0.594	0.559

R-squared	0.712
Adjusted R-squared	0.452
F-statistic	2.737
Prob(F-statistic)	0.014
Durbin-Watson statistic	2.116

Diagnostic Tests	F statistic	Probability
Breusch-Pagan-Godfrey Heteroskedasticity test	0.886	0.602
ARCH Heteroskedasticity	0.640	0.429
Breusch-Godfrey Serial Correlation LM Test	0.648	0.534
Jarque-Bera test	0.758	0.685
Ramsey reset test	4.964	0.038

Source: Author's computation

The parsimonious error correction model passed all diagnostic tests as revealed in Table 4.28. The serial correlation test and heteroscedasticity test show the absence of serial correlation and heteroscedasticity. The Jarque-Bera test indicated the series is normally distributed. The model is well specified given the results of the Ramsey Reset test results. The test for stability was conducted using the CUSUM test. The CUSUM test results suggest the stability of the model, as the plots stay within the critical 5 per cent bounds. The results are presented in Figure 4.1.

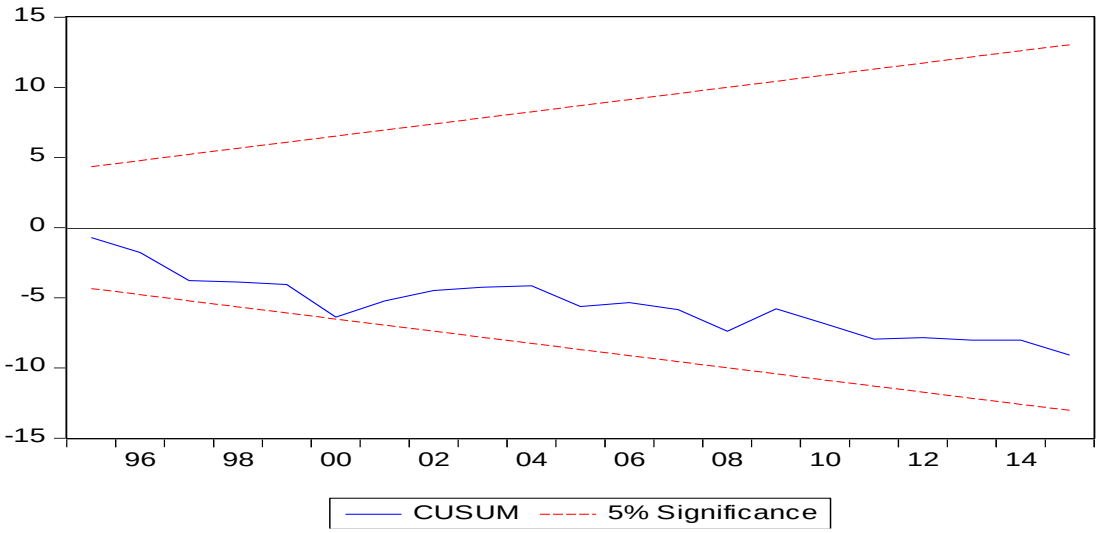

Figure 4.1: CUSUM test results

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Summary of findings

The first objective of this study examined the factors responsible for the various dimensions of SE. The findings in respect of the incentives for participation in the SE as obtained from the survey and the probit model are discussed as follows. The important demographic and dominant socio-economic features of the participants are summarised; males dominated the females which is opposite of what obtains in surveys carried out in the areas concerned (CBN/FOS/NISER, 2001; NBS, 2010). Most of the respondents were aged 15-35 years, which revealed that they were born in periods that coincided with the period of mismanagement, massive downsizing in the public sector, global economic recession, and structural changes in the economy. The participants were mainly sole proprietors involved in the wholesale and retail trade and operated from market stalls, street-side shops, and the roadside. Most of the respondents kept no written accounting records of their business transactions, thereby making it difficult to track their business activities for official purposes, although a good number of them finished from secondary school. Very few of the respondents registered their businesses and opened a business account in the name of the business. The main reason given is that they considered themselves too small to register. This limited their access to many credit opportunities, as most relied on personal savings to finance their business activities. This invariably made cash the dominant means of making payments.

Results relating to employment conditions reveal poor working conditions concerning benefits, which is an indicator of decent work, an objective of the sustainable development goals. For instance, a small percentage of respondents had a written contract with their employees, thereby making them vulnerable to the whims and caprices of the business owner. The least popular employment benefit is the pension, and this makes shadow economy workers susceptible to abject poverty in old age. Also, most were underemployed as they worked less than 40 hours per week.

The respondents provided reasons that were very strong motivations for participation in the shadow economy. They include leisure, the source of employment, the source of income, the source of profits, meeting existing good/service gap, access to finance and income flows for old age. This suggests that the shadow economy is a survivalist way of getting around the economic problems of the country.

The effects of being in the shadow economy were mainly harassment and concealment to avoid detection. Although, the majority stated that they were not harassed. However, for those harassed, the principal offence was non-payment of taxes/levies, which reduced their profits. The reasons given for non-payment were that it reduced profits and taxes were high.

The determinant of the shadow economy estimated using the probit model was a fallout of survey outcomes on the incentives to participate in the shadow economy. The indicator variables were incomplete accounting records, cash-based means of payment, non-registration, harassment and concealment of activities while the determinants were gender, age, marital status, education, the ownership structure of the business, sources of finance, tax morale, income and hours worked. As there were five equations, the results are mixed as the effects of the factors driving the various dimensions examined varied slightly. Controlling for other factors, age and marital status were not significant variables in explaining participation while educational status and hours of work were the only determinants that were consistent across the various definitions of SE.

The currency model revealed that the tax burden is the main reason why a large percentage of the monetary aggregates are the currency in circulation. Invariably, the tax burden was a factor responsible for the macro-dimension of the SE. The MIMIC model results, also confirmed these results as it revealed that tax revenue representing the tax burden and inflation, were positive and significant causal variables that influenced the shadow economy in Nigeria. On the other hand, GDP percentage growth was a negative and significant indicator of the shadow economy.

The second objective estimated the size of various dimensions of the SE. Both the survey outcomes and macro-based results provided the outcomes. The size of the shadow economy as obtained from the MIMIC model ranged from about 42 per cent to

about 75 per cent between 1975 and 2015. This is similar to estimates obtained by Ariyo and William (2011). This peak estimate was obtained in 1981, which coincided, with a meltdown in the economy occasioned by the international crisis, while, the lowest estimate obtained in 2004 coincided with a period during which massive policy restructuring of the economy took place. These estimates were compared with those obtained from the survey carried out. The estimates of the size obtained from different dimensions in 2014 were compared. It was observed that the dimension related to cash-based transaction yielded the largest size of SE (91 %), followed by incomplete records keeping which yielded a size of 89.75 per cent. On the overall, it was discovered that on average, the micro-based dimensions yielded a larger size of SE compared with the macro-based dimensions. The only exception to this generalisation is the dimension related to concealment and non-payment of taxes which yielded lower estimates on average. The results further revealed that the size of the shadow economy depends on the aspect of the shadow economy being investigated.

The growth model, which was estimated using the parsimonious error correction model, reveals that the shadow economy had a positive relationship with the economy. The effects of the shadow economy on economic growth validated the stance of Brambila-Macias and Guido (2010) while contradicting the negative position held by Loayza (1997). This implies a favourable impact on the economy. However, the effects gradually tapered off over time from a contribution to GDP growth of about 66 per cent to about 26 per cent. Besides, the results, in the long-run, suggest that drastic measures be directed at the shadow economy so that it contributes optimally to growth. This was the view of the earliest works carried out on the phenomena.

5.2 Recommendations and conclusions

Based on the findings of the study, this study recommends the government should not ignore the shadow economy but encourage it with incentives. The following incentives are recommended for implementation by the government to encourage the SE. Registration of business enterprises could be made more accessible by registering the owner(s). Ease in registration can be achieved by accessing and harmonising databases, kept by various data capturing agencies and banks. This is to forestall the hidden internal operations of microenterprises and monitor their activities for optimal growth of economic activities.

The enterprise owner should be enlightened on the benefits of registration and using other payments channel other than cash alone. The benefits of registration may be tied to incentives such as ease of access to credit and even tax holidays. The costs of registration and credit should be minimised to prevent the concealment of goods and premises.

The moral obligation of taxpayers to pay taxes can be enhanced when the government is responsible to the citizens by putting in place the basic infrastructure that will aid economic activities. The current tax regime should be made more transparent, flexible, and convenient to allow for voluntary participation by shadow economy participants. Tax proceeds should be invested in productive infrastructure as it cuts the cost of business and boosts tax morale. This will further boost the SE and increase the revenue generated from it especially against the backdrop of dwindling funds occasioned by unstable oil prices. Also, increased tax morale will lead to fewer defaults in tax payments and minimise the harassment faced by the shadow economy participants.

Other issues to be addressed by the government is the issue of education and raising the incomes levels which are to blame for the low productivity in the SE. Most participants in SE did not study beyond secondary school. Therefore, education should be given priority and various safety nets for vulnerable persons should be put in place to reduce income inequalities in the country.

The conclusions from this study are that the micro-based incentives to participate in the shadow economy are related to gender, level of education, access to credit and low tax morale. This gives support to the notion that the participants in the shadow economy should be encouraged by addressing these issues. Second, the macro-based incentives are tied to the avoidance of regulations such as paying taxes. Therefore, a policy should be put in place to ease the burden of taxes. Third, the size of the shadow economy of Nigeria is beneficial to the growth of the Nigerian economy. Therefore, the SE should be encouraged.

5.3 Contributions to knowledge

This study contributed to knowledge especially in the area of the empirical literature. Specifically, the contributions include;

1. A novel investigation of both micro and macro dimensions of the shadow economy, and its implications for policymaking.

2. The empirical analysis of additional dimensions, of the shadow economy such as incomplete records, concealment of activities and harassment arising from detection.

3. Country specific work on Nigeria, which estimates the size of the shadow economy from various dimensions and its relationship with the economy.

4. Findings that show the positive relationship between the shadow economy and economic growth, which, suggests the sector should be encouraged.

5.4 Limitations of the study and suggestions for further research

This study investigated various dimensions of SE for possible intervention by the government. However, the study is still characterised by various limitations, especially concerning the micro-dimensions of the SE. The main limitations are in respect of the survey carried out to evaluate country-specific reasons on why agents participate in the shadow economy. It was constrained by cost, time and most especially the insecurity witnessed in one of the states[22] under study. The study was carried out in two states of the federation and covered the main activities of the shadow economy of Nigeria. However, it may not represent the motivation to take part in the shadow economy in states that post a lower incidence.

Further research can investigate the reasons for the lower incidence in those states. Second, the survey only covered microenterprises while ignoring the incidence of shadow economy activities in bigger enterprises and the formal sector. Third, the survey was targeted at easily recognised participants and the results obtained could give biased estimates of aggregate behaviour of all the agents in the economy.

[22] The state is Kano state. During the period, there were Boko-Haram attacks, which made the distribution and administration of questionnaires difficult.

REFERENCES

Abid, M. 2016. Size and implication of informal economy in African countries: evidence from a structural model. *International economic journal*. Retrieved Jan. 16, 2019, from http://dx.doi.org/10.1080/10168737.2016.1204342.

Abumere, S.I., Arimah, B.S and Jerome, T.A. 1998. The informal sector in Nigeria's development process. *Development Policy Centre Research Report* 1.

Adenikinju, A. 2005. Analysis of the cost of infrastructure failures in a developing economy; the case of the electricity sector in Nigeria. *AERC Research Paper* 148.

Ahumada, H., and Alvaredo, F. 2006. The demand for currency approach and the size of the shadow economy: a critical assessment. *University of California Berkeley Working Paper Series.*

Akerele, W.O. 1997. The effect of economic adjustment on employment in the urban informal sector of Ibadan City. *NISER Monograph Series* 3.

Allingham, M. and Sandmo, A. 1972. Income tax evasion: a theoretical analysis. *Journal of Public Economics* 1:323-338.

Aminu, A. 2010. Determinants of participation and earnings in wage employment in Nigeria. Paper Presented at IZA/ World Bank Conference on Employment and Development.

Angel-Urdinabe, D., and Tanabe, K. 2012. Micro-determinants of informal employment in the Middle East and North Africa Region. *World Bank Social Protection Discussion Paper* 1201.

Ariyo, A., and William, B. 2011. Currency demand, the underground economy and tax evasion: the case of Nigeria. *Journal of Monetary and Economic Integration* 11.2: 129–157.

Aryeetey, E., Baah-Nuakoh, A., Duggleby, T., Hettige, H. and Steel, W. 1994. Supply and demand for finance of small-scale enterprises in Ghana. *World Bank Discussion Paper* 251.

Asuquo, I., Ejabu, F., Bogbo, R., Atu, O. and Adejonpe, A. 2018. Accounting behaviour of small scale enterprises in Nigeria: focus on business sustainability and growth. *Journal of Business and Economic Development* 3.2: 43-50.

Bajada, C. 1999. Estimates of the underground economy in Australia. *The Economic Record 3*: 1-11.

Bank of Industry (BOI). 2018. Economic development through the Nigerian informal sector: a BOI perspective. *BOI Working Paper* Series 2.

Barro, R. 1990. Government spending in a simple model of endogenous growth. *Journal of Political Economy* 98.S5: 103-125.

_____ and Sala-i-Martin, X. 1995. *Economic growth*. New York: McGraw Hill.

Batini, N,. Kim, N,. Levine, P. and Lotti, E. 2009. Informal labour and credit markets: a survey. *University of Surrey School of Economics Discussion Paper* 0609.

Becker, G. 1965. A theory of the allocation of time. *The Economic Journal* 75: 493–517.

Bernard, H. 2002. *Research methods in anthropology: qualitative and quantitative methods*. 3rd ed. California: Altamira.

Bhattacharyya, D. 1990. An econometric method of estimating the hidden economy, United Kingdom (1960-1984): estimates and tests. *The Economic Journal* 100.402: 703-717.

Bollen, K. 1989. *Structural equations with latent variables.* New York: John Wiley and Sons.

Bose, N., Capasso, S. and Wurm, M. 2008. The impact of banking development on the size of the shadow economy. *Centre for Studies in Economics and Finance (University of Salerno) Working Paper* 207.

Brambila-Macias, J. and Guido, C. 2010. Modelling the informal economy in Mexico: a structural equation approach. *The Journal of Developing Areas* 44.1: 345-365.

Browne, M. and Cudeck, R. 1993. Alternative ways of assessing equation model fit. *Testing structural equation models*. K.A. Bollen, and S.L. Long. Eds. Newbury Park: Sage. 136-162.

BudgIT. 2017. Lagos's informal sector: Taxation and contribution to the economy. Retrieved Jan. 16, 2019, from https://ng.boell.org/sites/default/files/uploads/2017/02/budgit_final_report_30.1.17.pdf.

Buehn, A. and Schneider, F. 2009. Corruption and the shadow economy: a structural equation model approach. *IZA Discussion Paper* 4182.

Cagan, P. 1958. The demand for currency relative to the total money supply. *The Journal of Political Economy* 66.4: 303-328.

Cameron, C. and Trividi, P. 2005. *Microeconometrics methods and application*s. New York: Cambridge University Press.

Campbell, D. and Fiske, D. 1951. Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin* 56: 81-105.

Castells, M., and Portes, A. 1989. World underneath: the origins, dynamics and effects of the informal economy. A. Portes., M. Castells, and L. Benton. Eds. *The informal economy: Studies in advanced and less developing countries.* Baltimore: John Hopkins University Press. 1–11.

CBN/FOS/NISER. 2001. *A Study of Nigeria's informal sector: statistics on Nigeria's informal sector*. I. Abuja: CBN.

Central Bank of Nigeria (CBN). 2012. *CBN statistical bulletin*. Abuja: CBN.

Charemza, W. and Deadman, D. 1997. *New directions in econometric practice*. 2nd ed. New York: Edward Elgar Publishing.

Chen, M. 2005. Rethinking the informal economy. *UNU-WIDER Research Paper* 10.

Collins, C., Muhammad, S. and Alvaro, M. 2015. Determinants of the level of informality of informal micro-enterprises: some evidence from the City of Lahore, Pakistan, *World development*. Retrieved Jan. 16, 2019, from http://dx.doi.org/10.1016/j.worlddev.2015.09.003.

Collins-Sowah, P., Kuwornu, J. and Tsegai, D. 2103. Willingness to participate in micro pension schemes: evidence from the informal sector in Ghana. *Journal of Economics and International Finance* 5.1: 21-34.

Cook, T. and Campbell, D. 1979. *Quasi-experimentation: design and analysis issues for field settings.* Boston: Houghton Muffin Company. 37- 94.

Cronbach, L. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika.* 16.3: 297-334.

Dell'Anno, R. 2007. The shadow economy in Portugal: an analysis with the mimic approach. *Journal of Applied Economics* 10.2: 253-277.

De Soto, H. 1989. *The other path*. New York: Harper and Row.

Dickey, D. and Fuller, W. 1981. Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica* 49.4*:* 1057-1072.

Drost, E. 2011. Validity and reliability in social science research. *Educational Research and Perspectives* 38.1: 105-123.

Eilat, Y. and Zinnes, C. 2000. The evolution of the shadow economy in transition countries: consequences for economic growth and donor assistance. *CAER II Discussion Paper* 83.

Engle, R. and Granger, C. 1987. Co-integration and error correction: representation, estimation, and testing. *Econometrica* 55.2: 251-276.

Faal, E. 2003. Currency demand, the underground economy and tax evasion – the case of Guyana. *IMF Working Paper* 7.

Fapohunda, O. 1985. *The Informal sector of Lagos: an inquiry into urban poverty and employment*. Ibadan: University Press Limited.

Farinmade, A. 2012. The challenges of improving informal sector activities conditions in Lagos Island, Nigeria. *British Journal of Arts and Social Sciences* 6.2: 218-232.

Feige, E. 1979. How big is the irregular economy?, *Challeng*e 22: 5–13.

Ferwerda., J, Deleanu, L. and Unger, B. 2010. Revaluating the Tanzi-model to estimate the underground economy. *Tjalling C.Koopmans Research Institute Discussion Paper Series* 4.

FIRS. 2019. Tax laws. Retrieved Jan. 16, 2019, from https://www.firs.gov.ng/TaxResources/TaxLaws.

Folawewo, A. 2006. Determinants of informal sector labour demand: an application of alternative methodological approaches to South Western states of Nigeria. *Applied Econometrics and International Development* 6.2: 147-160.

_____ 2013. *The informal labour market in developing countries*. Nigeria: Hope Publications.

Frey, B. and Schneider, F. 2000. Informal and underground economy. *International Encyclopedia of Social and Behavioural Science.* London: Elsevier. 7441-7446.

_____ and Weck, H. 1983. What produces a hidden economy? an international cross-section analysis. *Southern Economic Journal* 49.3: 822-832.

_____ and _____ 1984. The hidden economy as an 'unobserved' variable**.** *European Economic Review* 26: 33-53.

Friedman, E., Johnson, S., Kaufmann, D. and Zoido-Lobaton, P. 2000. Dodging the grabbing hand: the determinants of unofficial activity in 69 countries. *Journal of Public Economics* 76: 459-493.

George, P. 1994. The ambiguous moral foundations of the underground economy. *The Yale Law Journal* 103.8: 2259-2288.

Gerxhani, K. 2004. The informal sector in developed and less developed countries: a literature survey. Public *Choice* 120.3: 267-300.

Giles, D. 1999. Measuring the hidden economy: implications for econometric modelling. *The Economic Journal* 109.456: 370-380.

Greene, W. 2008. *Econometric Analysis*. 5th ed. London: Pearson.

Gutmann, P. 1977. The subterranean economy. *Financial Analysts Journal* 34.

Harris, J. and Todaro, M. 1970. Migration, unemployment and development: a two-sector analysis. *American Economic Review* 60.1: 126–142.

Hart, K. 1973. Informal income opportunities and urban employment in Ghana. *Journal of Modern African Studies* 11: 61-89.

Hassan, M. and Schneider, F. 2016. Modelling the Egyptian shadow economy: a currency demand and a MIMIC model approach. *CESifo Working Paper* 5727.

Henley, A., Arabsheibani, G. and Carneiro, F. 2006. On defining and measuring the Informal Sector. *IZA Discussion Paper* 2473.

Hill, R. 2002. The underground economy in Canada: boom or bust? *Canadian Tax Journal*. 50.5.

Hu, L. and Bentler, P. 1999. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling* 6.1: 1-55.

ILO. 1972. Employment, incomes and equality: a strategy for increasing productive employment in Kenya. *Mimeo*. Geneva: ILO.

____ 2002. Women and men in the informal economy: a statistical picture. *Mimeo*. Geneva: ILO.

Isachsen, A. and Strom, S. 1980. The hidden economy; the labour market and tax evasion. *Scandinavian Journal of Economics* 82: 304 – 311.

Johansen, S. 1995. *Likelihood-based inference in cointegrated vector autoregressive models.* Oxford: Oxford University Press.

_____ and Juselius, K. 1990. Maximum likelihood estimation and inferences on cointegration—with applications to the demand for money. *Oxford Bulletin of Economics and Statistics* 52: 169–210.

Johnson, S., Kaufmann, D. and Zoido-Lobaton, P. 1998. Regulatory discretion and the unofficial economy. *American Economic Review* 88: 387-392.

Joreskog, K. and Goldberger, A. 1975. Estimation of a model with multiple indicators and multiple causes of a single latent variable. *Journal of the American Statistical Association* 70.351: 631-639.

Kaufmann, D. and Kaliberda, A. 1996. Integrating the unofficial economy into the dynamics of post-Socialist Economies: a framework of analyses and evidence. *The Policy Research Working Paper 1691*.

Lackó, M. 1996. *Hidden economy in East-European countries in international comparison*. Laxenburg: International Institute for Applied Systems Analysis (IIASA).

La Porta, R. and Shleifer, A. 2008. The unofficial economy and economic development. *Brookings Papers on Economic Activity* Fall: 275-352.

Lavrakas, P. 2008. Encyclopaedia of survey research methods, 1 and 2. California: Sage.

Lewis, J and Sheppard, J. 2006. Culture and communication: can landscape visualisation improve forest management consultation with indigenous communities?. *Landscape and Urban Planning* 77: 291-313.

Lewis, W.A. 1954. Economic development with unlimited supplies of labour. *The Manchester School* 22.2: 139–191.

Lippert, O. and Walker, M. 1997. *The underground economy: global evidences of its size and impact*. Vancouver: The Frazer Institute.

Loayza, N. 1997. The economics of the informal sector: a simple model and some empirical evidence from Latin America. *Policy Research Working Paper* 1727: The World Bank.

Mabogunje, A. and Filani, M. 1981. The informal sector in a small city: the case of Kano (Nigeria). *The Urban Informal Sector in Developing Countries; Employment, Poverty and Environment*. S. Sethuraman. Eds. Geneva: International Labour Office. 82-89.

MacKinnon, J. 1991. Critical values for cointegration tests. *Long-Run Economic Relationships.* R. Engle and C. Granger. Eds. Oxford: Oxford University Press. 267-276.

Meagher, K. and Yunusa, M. 1996. Passing the buck; structural adjustment and the Nigerian urban informal sector. *United Nations Research Institute for Social Development Discussion Paper* 75.

Medina, L., Jonelis, A. and Cangul, M. 2017. The informal economy in Sub-Saharan Africa: size and determinants. *IMF Working Paper* 17.156.

Medina, L. and Schneider, F. 2018. Shadow economy around the world: what did we learn over the last 20 years?. *IMF Working paper.* 17.45.

National Bureau of Statistics (NBS). 2009. *Labour force survey*. 476. Abuja: National Bureau of Statistics.

_____2010. *National manpower stock and employment generation survey*. July. Abuja: National Bureau of Statistics.

_____2016. *Formal and informal sector split of GDP*. Abuja: National Bureau of Statistics.

_____ and SMEDAN. 2012. *Survey report on micro, small and medium enterprises (MSMEs) in Nigeria*.

Nchor, D. and Adamec, V. 2015. Unofficial economy estimation by the MIMIC model: the case of Kenya, Namibia, Ghana and Nigeria. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunenesis*. 6396: 2043-2049.

Nikopour, H. and Habibullah, M. 2010. Shadow economy and poverty. *MPRA Paper* 23599.

Nunnally, J. 1978. *Psychometric theory*. New York: McGraw-Hill.

Obayelu, A. and Uffort, L. 2007. Comparative analysis of the relationship between poverty and underground economy in the highly developed, transition and developing countries. *MPRA Paper* 2054.

Odusola, A. 2006. Tax policy reforms in Nigeria. *UNU-WIDER Research Paper*. 2006/03.

OECD. 2002. *Measuring the non-observed economy.* Paris: OECD.

Ogun, O. 1993. Nigeria's trade policies during and after the oil boom: an appraisal. T. Oyejide and M. Obadan. *Applied Economics and Economic Policy*. Eds. 198-222.

_____ 2014. Modelling Africa's economic growth. *Journal of Economics and Economic Research* 15.2: 143-164.

Ogwumike, F. 2001. Appraisal of poverty and poverty reduction strategy in Nigeria. *Central Bank of Nigeria Economic and Financial Review* 39.4: 45-71.

Okoroafor, A. 1990. The Nigerian labour market: a profile of features, problems and prospects. J. Umo. *Employment generation in Nigeria: issues and strategies.* Eds. Lagos: National Directorate of Employment.

Omisakin, I. 1999. Factors influencing success or failure of enterprises in the informal sector the case of Ibadan City. *NISER Monograph Series* 9.

Oni, B. 1994. SAP the informal sector in Nigeria: a case study of increasing employment. *Economic Reform Policies and the Labour Market in Nigeria.* T. Fashoyin. Eds: 84-105.

_____ 2006. Support strategies for the informal sector in Nigeria: a case study of leather works and textile/ garment enterprises. *Report.* Abuja: Independent Policy Group.

Phillips, P. 1987. Time series regression with a unit root. *Econometrica* 55.2: 277-301.

Rauch, J. 1991. Modelling the informal sector formally. *Journal of Development Economics* 35.1: 33–47.

Renooy, P. 1990. *The informal economy: meaning, measurement and social significance*, Amsterdam: Netherlands Geographical Studies.

Romer, P. 1990. Endogenous technical change. *Journal of Political Economy* 98: 71-102.

Romero, R. 2010. The dynamics of the informal economy. *CSAE Working Paper* 7.

Salisu, M. 2001. Incentive structure, civil service efficiency and the hidden economy in Nigeria. *UNU/WIDER Discussion Paper 86.*

Sarte, P. 1997. Informality and rent-seeking bureaucracies in a model of long-run growth. *Federal Reserve Bank of Richmond Working Paper* 99-7.

Schneider, F. 2005. Shadow Economies around the World: what do we really know?. *European Journal of Political Economy* 21.4: 598-642.

Schneider, F. and Enste, D. 2000. Shadow economies: size, causes and consequences, *Journal of Economic Literature* 38.1: 73-110.

Schneider, F. Sookram, S. and Watson, P. 2006. Characteristics of the household sector of the hidden economy in an emerging economy. *Department of Economics, University of Linz Working Paper* 0605.

_____, Buehn, A. and Montenegro, C. 2010. Shadow economies all over the World: new estimates for 162 countries from 1999 to 2007. *World Bank Policy Research Working Paper* 5356.

Sethuraman, S. 1981. *The urban informal sector in developing countries: employment, poverty and environment*. Geneva: International Labour Office.

Sookram, S. and Watson, P. 2008. Small business participation in the informal sector of an emerging economy. *Journal of Development Studies* 44.10: 1531-1553.

StataCorp. 2013. Stata: Release 13. Statistical Software. College Station, TX: StataCorp LP.

Tanzi, V. 1980. The underground economy in the United States: estimates and implications, *Banca Nazionale del Lavoro Quarterly Review* 135.

_____ 1983. The Underground Economy in the United States: annual estimates, 1930-1980. *IMF Staff Papers* 30.2: 283-305.

Thomas, J. 1999. Quantifying the black economy: measurement without theory yet again?. *The Economic Journal* 109.456: 381–389.

Torgler, B. and Schneider, F. 2007. Shadow economy, tax morale, governance and institutional quality: a panel analysis. *Institute of Labour Discussion Paper* 2563.

Vargas, J. 2015. Informality in Paraguay: macro-micro evidence and policy implications. *IMF working paper* 245.

William, B. 2010. Tax evasion and economic growth in selected African countries (1975-2006). PhD. Thesis. Dept. of Economics. University of Ibadan. xiii +181pp.

World Bank. 2011. *Doing business 2011: making a difference for entrepreneurs*. Washington, DC: World Bank.

World Bank. 2016. *Doing Business 2016: measuring regulatory quality and efficiency.* Washington, DC: World Bank.

World Bank. 2018. *World Bank development indicators*. Washington, DC: World Bank.

Wu, D. and Schneider, F. 2019. Nonlinearity between the shadow economy and the level of development. *IMF working paper* 48.

APPENDIX I: Questionnaire

University of Ibadan, Ibadan, Nigeria

Department of Economics,

Dear Respondent,

SURVEY ON THE SHADOW ECONOMY OF NIGERIA

This questionnaire forms part of a Doctoral research thesis aimed at ascertaining the incentives for participation, estimating the size and evaluating the effects of the shadow economy on the Nigeria economy.

I would be grateful if you kindly respond to questions asked by the interviewer. Your responses will be treated with the utmost confidentiality.

Thanks for your cooperation.

Yours faithfully,

Abiola Oresajo

SECTION I: To be filled by the interviewer.

Questionnaire number-------

Interviewer--------

Address of microenterprise-----

LGA ------

Town------

SECTION II: BIO-DATA OF RESPONDENT

1. Sex

Male ( ) Female ( )

2. Age

15-24 years ( ) 25-34 years ( ) 35-44 years ( ) 45-64 years ( )

Over 64 years ( )

3. Marital status

Single ( ) Married ( ) Separated/Divorced ( ) Widowed ( )

4. Educational Status

No formal education ( ) Primary ( ) Secondary ( )

Vocational/technical ( ) Tertiary ( )

5. How many dependents do you have? _____

SECTION III: CHARACTERISTICS OF BUSINESS

6. What is the ownership status of this business?

Sole proprietorship ( ) Partnership ( ) Family owned business ( )

Cooperative ( ) Registered enterprise/company ( ) Others ( )

7. Sector of activity

Agriculture, forestry and fishing ( ) Wholesale/Retail Trade ( )

Manufacturing ( ) Transportation and storage ( )

Accommodation and food services ( ) Others ( )

8. Where do you mainly operate this business from?

Home ( ) Factory ( ) Market ( ) Shop ( )

Roadside ( ) Farm ( ) Mobile/ No fixed Location ( )

others (specify) _____

9. How does this business maintain its accounting records?

Formal account-keeping ( ) Records for personal use ( )

No written records kept ( )

10. What type of employment contract did you go into with your employees?

Written contract ( ) Verbal agreement ( ) No contract ( )

11. Do they have access to the following employment benefits?

Pension Yes ( ) No ( ) Paid holidays Yes ( ) No ( )

Sick leave Yes ( ) No ( ) Maternity leave Yes ( ) No ( )

12. Do you have a bank account in the name of the business?

Yes ( ) No ( )

13. Which of the following means of payment do you mainly use for business transactions?

Cash ( ) Cheque ( ) Point of Sale Terminals

Internet banking ( ) Others ( )

14. In the last 12 months, which of the following was your major source of finance?

Commercial Bank loan ( ) Microfinance bank loans ( )

Association support/Cooperative ( ) Informal savings (Adashi/Ajo/Esusu) ( )

Money lenders ( ) Loans from Friends/relatives ( )

Remittances from abroad ( ) Personal savings ( )

Government programme/NGOs/International Organization ( )

Others ( )

SECTION IV: INCENTIVES FOR PARTICIPATION

15. Is this business registered with any government body?

Yes ( ) In progress ( ) No ( )

16. If no, what are your reasons?

Not aware of any requirement to register ( ) Not sure where to register ( )

Do not have time to register ( ) To avoid dealing with government officials ( )

To avoid financial burden of taxes ( ) Too small in size to register ( )

To reduce production costs ( )

17. Do you hold another job apart from running your business?

Yes ( ) No ( )

18. If yes, who is your employer?

Government ( ) Private sector (Formal) ( ) Private sector (informal) ( )

NGO/International Organization ( ) NGO/ International organization ( )

Religious Organization ( ) Self Employed ( )

Others (specify) _____

19. **What are your reasons for participation in this business?**

Reasons	Very strong motivation	Strong motivation	Indifferent	Weak motivation	Very weak motivation
Leisure					
Family tradition					
Employment					
Source of income					
Profit					
Existing good/service gap					
Not costly to start or operate					
Tax regime					
Government support					
Existing infrastructure, e.g. electricity, roads etc.					
Access to finance					
Disengagement from a place of work					
Income flows for old age					

20. **Do you pay taxes to the government?** In full ( ) Partially ( )

Not at all ( )

21. If paid, which of the following taxes/levies do you pay?

Company income tax ( ) Personal income tax ( ) Value added tax ( )

Business premises registration and renewal levy ( )

Shop/Market/Motor park rate ( ) Signboard permit ( ) Tenement rate ( )

Others (specify) _____

22. If taxes are paid partially or not at all, what are the reasons?

Taxes are too many ( ) Taxes are high ( ) Taxes reduce profits ( )

Perceived deterioration in public sector services ( ) Not sure where to pay ( )

Earn below taxable income ( ) low risk of detection by tax authorities ( )

23. If the government proposes to increase the tax paid, to increase the quantity and quality of public services, what will be your response?

Support ( ) Indifferent ( ) Oppose ( )

24. What is your opinion on the following factors as it affects formalizing your business?

Factors	Excessive	Moderate	Low	Indifferent
Gov. regulations on taxes				
Gov. regulations on minimum wage				
Gov. regulation on business registration				
Cost of entry into the formal sector				
Corruption and bribery				

25. How do the following social and economic factors affect the operation of your business?

	Substantially( )	Moderately ( )	Slightly ( )	Not at all ( )
Importation policy				
Macroeconomic policy: a) Interest rate b)Foreign Exchange rates				
Infrastructure				
Security and crime				

Political environment				
Culture and tradition				
Cashless policy				

SECTION V: SIZE OF SHADOW ECONOMY

26. What are the categories of employees employed by the business in the past month?

S/N	Employment status	Number
1.	Full-time paid workers	
2.	Part-time paid workers	
3.	Casual paid Workers	
4.	Unpaid workers	

27. What is your average monthly income/profit?

Less than N30, 000 ( ) 30,001-50,000 ( ) 50,001-100,000 ( )

100,001-500,000 ( ) 500,001-1,000,000 ( ) 1,000,001 and above ( )

28. How much is spent monthly on business related expenses e.g. on production, purchases, wages and rent? _____

Less than N50, 000 50,001-100,000 ( ) 100,001-500,000 ( )

500,001-1,000,000 ( ) 1,000,001 and above ( )

29. What is the present worth of capital invested in this business?

Less than 50,000 ( ) 50,001-100,000 ( ) 100,001-500,000 ( )

500,001-1,000,000 ( ) 1,000,001 and above

30. How many hours do you spend weekly to run the business?

Less than 20 hours ( ) 20 to 35 hours ( ) 36 to 40 hours ( )

Over 40 hours ( )

SECTION VI: EFFECTS OF THE SHADOW ECONOMY

31. Have you ever in the course of running your business in the last year been harassed by law enforcement agencies e.g. Police, customs officers or government officials e.g. tax officers?

Yes ( ) No ( )

32. If yes, which of them and for what offence or reason/s.

1	

2	
3	
4	
5	
6	

33. If yes, what was the effect on your business?

Reduction of profits ( ) Loss of property ( ) Relocation costs ( ) Low sales ( )

34. If information gets to you that government officials were coming to inspect your business, would you conceal your goods, records or premises?

Yes ( ) No ( )

35. In the last 12 months, did you try to obtain a loan for your business from the bank? Yes, successfully ( ) Yes, failed ( ) No ( )

36. If yes, but it failed, which of the following reasons is it due to?

Burdensome requirements ( ) Insufficient collateral ( )

Low repayment capability ( ) High interest rate ( )

Incomplete/no business registration documents ( )

Bad luck ( ) No reason ( )

Others (specify) _____

37. What is the impact of your business and similar businesses on the following?

	High impact	Average impact	Low impact	No impact	Negative impact
Income generation					
Job creation					
Poverty reduction					
Production of goods and Service					

Exports/foreign exchange earning					
Tax revenue generation					

38. How can businesses like yours be encouraged to thrive in Nigeria?

_____

_____

_____

_____

_____

_____

_____

_____

_____

Thank you.

APPENDIX II: Description of variables used in the probit model

Variable	Description	
Dependent variables		
Incomplete Records	Does the business maintain accounting records?	Records=1, if formal accounting records are kept. Records=0, if no formal accounting records are kept and if records are kept for personal purposes.
Cash-based Payments	Main means of payment for business transactions	Payments=1, if cash is used. Payments=0, if other means such as cheque, point of sale terminal, internet banking is used.
Registration	Is the business registered with any government body?	Registration=1, if Yes. Registration=0, if no, and if registration is in progress.
Harassment	Has the business owner ever been harassed by law enforcement agencies in the last year?	Harassment=1, if yes. Harassment=0, if no.
Concealment	If government officials were to inspect the business; would goods, records and premises be concealed?	Concealment=1, if yes. Concealment=0, if no.
Independent variables		
Gender	Gender of the respondent	male=1, female=0 female=1, male=0
Age	Age of the respondent	15-24 years=1, otherwise=0 25-34 years=1, otherwise=0 35-44 years=1, otherwise=0 45-64 years=1, otherwise=0 Over 64 years=1, otherwise=0

Marital status	Marital status of the respondent	Single=1, otherwise=0 Married=1, otherwise=0 Separated/divorced=1, otherwise=0 Widowed=1, otherwise=0
Education	Level of education	No formal education=1, otherwise=0 Primary education=1, otherwise=0 Secondary education=1, otherwise=0 Vocational/technical=1, otherwise=0 Tertiary education=1, otherwise=0
Business	Ownership status of the business	Sole proprietorship=1, otherwise=0 Partnership=1, otherwise=0 Family owned=1, otherwise=0 Cooperative=1, otherwise=0 Registered enterprise/company=1, otherwise=0 others=1, otherwise=0
Pension	Does the business contribute to a pension scheme on behalf of its employees?	Pension paid=1, otherwise=0 No pension paid=1, otherwise=0
Financing	The main source of finance to the business.	Bank loan=1, otherwise=0 Microfinance bank loan=1, otherwise=0 Association support=1, otherwise=0 Informal saving=1, otherwise=0 Money lenders=1, otherwise=0 Friends=1, otherwise=0 Remittances from abroad=1, otherwise=0 Personal savings=1, otherwise=0

		Government/NGO=1, otherwise=0 Others=1, otherwise=0
Tax morale	Response to tax payment if increased.	Support=1, otherwise=0 Indifferent=1, otherwise=0 oppose=1, otherwise=0
Income	Income earned from business	Less than ₦30,000=1, otherwise=0 ₦30,001 to 50,000=1, otherwise=0 ₦50,001 to 100,000=1, otherwise=0 ₦100,001 to 500,000=1, otherwise=0 N500,001 to 1,000,000=1, otherwise=0 ₦1,000,001 and above=1, otherwise=0
Hours	Hours worked weekly	Less than 20 hours=1, otherwise=0 20 hours to 35 hours=1, otherwise=0 36 hours to 40 hours=1, otherwise=0 Over 40 hours=1, otherwise=0
Bankloan	Any attempt to obtain a bank loan in the last 12 months.	Successfully=1, otherwise=0 failed=1, otherwise=0 no attempt=1, otherwise=0

APPENDIX III: Description of variables used in MIMIC model

Variables	Description	Sources
Casual variables		
Share of direct taxes as a proportion of GDP	Average of company tax revenue and custom and excise duty as a proportion of GDP	CBN Statistical Bulletin (various years)
Inflation	Inflation, as measured by the consumer price index, reflects the annual percentage change in the consumer price index	World Development Indicators (2018)
General government final consumption expenditure (percentage of GDP)	Annual government final consumption expenditure based on constant local currency.	World Development Indicators (2018)
Unemployment, total (% of total labour force)	Unemployment refers to the share of the labour force that is without work but available for and seeking employment.	World Development Indicators (2018)
Indicator variables		
M0/M1	Currency outside banks normalised by narrow money (M1)	World Development Indicators (2018)
Labour force participation rate, total (% of total population ages 15-64)	Labour force participation rate is the proportion of the population ages 15-64 that is economically active: all people who supply labour for the production of goods and services during a specified period.	World Development Indicators (2018)

APPENDIX IV: Description of variables used in Growth model

Variables	Description	Sources
Shadow economy (percentage of GDP)	-	Author's computation from the MIMIC model and currency demand model
GDP per capita	GDP per capita is gross domestic product divided by midyear population. Data are in Naira.	World Development Indicators (2018)
GDP per capita growth (annual percentage)	The annual percentage growth rate of GDP per capita.	World Development Indicators (2018)
Secondary School enrolment	Gross enrolment ratio, secondary, both sexes (%)	World Development Indicators (2018)
Investment	Gross capital formation (% of GDP)	World Development Indicators (2018)