Asian Economic and Financial Review
ISSN(e): 2222-6737
ISSN(p): 2305-2147
DOI: 10.18488/journal.aefr.2020.107.833.860
Vol. 10, No. 7, 833-860.
© 2020 AESS Publications. All Rights Reserved.
URL: www.aessweb.com

IMPROVED PUBLIC SERVICES AND TAX COMPLIANCE OF SMALL AND MEDIUM SCALE ENTERPRISES IN NIGERIA: A GENERALISED ORDERED LOGISTIC REGRESSION

Oluwafadekemi S. Areo[1+]
Obindah Gershon[2]
Evans Osabuohien[3]

[1]*Department of Economics and Development Studies Covenant University, Ota, Nigeria.*
Email: oluwafadekemiareo@yahoo.com Tel: 2349036870987
[2]*Department of Economics and Development Studies & Co-Cahir, Centre for Economic Policy and Development Research (CEPDeR) Covenant University, Ota, Nigeria.*
Email: obinda.gershon@covenantuniversity.edu.ng Tel: +2348186456785
[3]*Department of Economics and Development Studies & Chair, Centre for Economic Policy and Development Research (CEPDeR) Chair, Regional Centre of Expertise Ogun (RCE Ogun) Covenant University, Ota, Nigeria.*
Email: evans.osabuohien@covenantuniversity.edu.ng Tel: +2348146678226


(+ Corresponding author)

Article History
Received: 10 April 2020
Revised: 13 May 2020
Accepted: 16 June 2020
Published: 27 July 2020

Keywords
Tax compliance
Small
Medium scale enterprises (SMEs)
Public goods and services
Generalised ordered logistic Regression, Nigeria, Likelihood.

JEL Classification:
H21, H25, H26, H32.

ABSTRACT

In this paper, we assess tax compliance among small and medium scale enterprises (SMEs) in Nigeria from the perspective of improving public goods and services. We utilise the Nigerian Economic Summit Group (NESG) 2018 Firms Survey Dataset on taxpayers' perception and attitudes and estimate the model of this research using the Generalised ordered logistic regression analysis. This methodology relaxes the assumption of equal odds as the explanatory variables increase. The results show a positive relationship between improved public goods and services and tax compliance of SMEs in Nigeria. However, the analysis reveals that a small increase in the improvement of public goods has a higher likelihood of moving SMEs to become low tax compliant than being tax compliant. We also find that the public goods with the highest likelihood of improving tax compliance of SMEs in Nigeria are public transport, security, and law courts. Furthermore, the findings reveal a significant positive relationship between Tax compliance of SMEs in Nigeria and tax knowledge, tax penalty, and trust in the government. The paper concludes that policymakers in Nigeria should revisit tax policies geared at improving Tax compliance of SMEs. The steps should include properly combining economic and psychological factors based on the extent to which tax non-compliant SMEs can be moved to become tax compliant.

Contribution/ Originality: This study contributes to the existing literature on SMEs tax compliance in Nigeria through identification of public goods with the highest likelihood of improving their tax compliance. Also, the adopted methodology revealed why previous tax policies have only increased the proportion of low tax compliant SMEs over tax compliant ones.

1. INTRODUCTION

In Nigeria, the issue of tax non-compliance is seen in both the formal and informal sector, among the wealthy and the poor, among corporate bodies as well as Entrepreneurs. Income taxes are mostly paid by persons who are formally employed, as well as large corporations (Kangave, Nakato, Waiswa, Nalukwago, & Zzimbe, 2018). The informal sector also referred to as the black economy, is made up of small-sized economic activities that are not

© 2020 AESS Publications. All Rights Reserved.

being monitored by the tax authorities (Slemrod, 2019). Taxpayers among the Small and Medium Scale Enterprises (SMEs) in Nigeria have been contributing less than 5 per cent to the annual tax revenue generated, despite making up about 96 per cent of businesses, 84 per cent of employment, and 48 per cent of national GDP in the last five years (Obara & Nangih, 2017). This sector of the economy is of utmost importance as it serves as a critical source of employment, competition, innovation, poverty reduction, and economic growth (Ayuba, Saad, & Ariffin, 2018). However, more than 70 per cent of the SMEs in Nigeria are not paying taxes, and the few that are paying are not paying correctly (Obara & Nangih, 2017).

Among Sub Saharan African (SSA) countries, Nigeria has one of the lowest tax revenue to Gross Domestic Products (GDP) ratio of about 6.5 per cent, with countries like South Africa and Seychelles having ratios of about 28.4 and 31.5 respectively (International Monetary Fund Fiscal Monitor, 2018). Nigeria is, therefore, yet to attain the minimum tax revenue to GDP threshold of 15-20 per cent, as recommended by the United Nations and the World Bank in 2015, for the achievement of the Sustainable Development Goals (SDGs) in 2030 (Umar, Derashid, Ibrahim, & Bidin, 2019).This threshold is necessary because health, education, power, transportation, and sanitation; which are key targets of the SDGs require additional finances if the SDGs are to be achieved (Adeleye, Osabuohien, & Asongu, 2020; Gaspar, Amaglobeli, Garcia-Escribano, Prady, & Soto, 2019; Gupta & Plant, 2019; Prichard et al., 2019; United Nations, 2017; World Bank, 2018). Tax compliance has, therefore, become a core development objective in Nigeria due to the rising public debts of about US$81.27 and a growing debt servicing ratio of about 50 per cent of government revenue, among other factors (African Development Bank-AFDB, Nigeria Economic Outlook, 2020).

The search for a sustainable solution to tax non-compliance has remained a paramount agenda for the Nigerian government and the tax authorities. The Self-assessment system was introduced in 2011 but failed in its objectives, as the voluntary compliance and knowledge it required were not precisely available (Kasum, Sanni, & Fagbemi, 2019). More so, the primary objective of the National Tax Policies (NTP) implemented in 2012 and 2017 was to put in place a strong and productive tax system in Nigeria, with a focus on legislative amendments, to reduce the tax burdens of corporate firms and SMEs. The presumptive tax regime was implemented based on the tax policies to collect taxes from SMEs (Udoh, 2015). The presumptive taxation system is used to predict taxpayers' income based on information about variables not considered in the standard computation of taxable income (Adeleye, Osabuohien, Bowale, Matthew, & Oduntan, 2018; Bucci, 2019). Despite its objective to increase overall revenue generated from this sector, tax compliance is still low (Olaitan, 2016). The most recent effort is the just enacted 2020 Public Finance Act in Nigeria which has a vital goal to improve the ease of doing business in Nigeria and also to reduce the burdens of SMEs. SMEs with annual turnovers below a particular threshold was therefore exempted from paying Value Added Taxes (VAT) and Company Income Taxes-CIT (Budget Office of the Federation, 2020). The economic and psychological factor schools of thought explain tax compliance. In the psychological school of thought, one of the determinants of tax compliance is the creation of a fiscal social contract (Alasfour, 2019; Bird & Davis-Nozemack, 2018; Da Silva, Guerreiro, & Flores, 2019; Gobena & Van Dijke, 2017; Umar et al., 2019). When tax compliance is explained concerning the provision of socioeconomic goods and services, the creation of a fiscal social contract is in view. This contract binds the government and the citizens and does not disaggregate the citizens into the wealthy and the poor. It opines that citizens should pay their taxes to the government and will, in turn, be given projects and goods and services for the paid taxes (Fjeldstad, Schulz-Herzenberg, & Hoem Sjursen, 2012; George, Olayiwola, Adewole, & Osabuohien, 2013; Timmons, 2005; Umar & Tusubira, 2017). This determining factor has worked in advanced countries like Sweden, where one of the reasons provided for the attainment of a high tax compliance rate is the expansion of the welfare benefits like all-inclusive social insurance schemes and diminishing wage inequality (Nistotskaya & D'Arcy, 2017). The Swedish government used a more service-oriented approach to improve citizens' voluntary tax compliance which thus created an early fiscal social contract between the Swedish government and the citizens (Nistotskaya & D'Arcy, 2017). However, from the taxpayers' narratives in Nigeria, it

© 2020 AESS Publications. All Rights Reserved.

has been revealed that the citizens are unhappy with the non-transparent tax systems, and the deplorable state of socioeconomic conditions (Umar & Tusubira, 2017).

Advanced economies have relatively performed well in deploying taxation as a tool for achieving societal development. However, the same cannot be said for developing countries, Nigeria inclusive, where government spending on public goods and services is low (Okorie, Osabuohien, & Oaikhenan, 2020; Traoré, 2018). In Nigeria, recurrent expenditure still takes about 45.7 per cent of the total government spending, while capital expenditure is about 26.3 per cent. The government expenditure allocation to roads is about 2.4 per cent while for electricity it is just about 1.2 per cent (Budget Office of the Federation, 2020). Electricity generation in Nigeria is as low as 3355 megawatts, which is not even enough to power a business district in New York City, how much more cater for the needs of individuals and businesses in Africa's most populous nation (Efobi, Beecroft, & Osabuohien, 2014; Matthew et al., 2019). Expenditure allocations to security and public transportation are as low as 1.1 per cent and 1.14 per cent, respectively. Businesses will always require various means of transportation to bring in raw materials as well as to move out their goods and services to the consumers. This low rate of investment in transportation will, therefore, have adverse effects on small businesses. The low rate of the allocation to security also puts SMEs at risk of theft, slow response to fire outbreaks as well as the destruction of their properties (Olaitan, 2016).

Empirical researches in Nigeria and other developing countries have found mixed results when Tax compliance of SMEs is explained with respect to the various determinants, provision of public goods and services inclusive. The results have shown significant positive or negative relationships between Tax compliance of SMEs and improved tax morale, improved public goods and services, reduced corruption, improved trust in the government as well as tax rates, tax penalties, and tax audits (Lee, Gokalp, & Kim, 2019; Newman, Mwandambira, Charity, & Ongayi, 2018; Otusanya, Adeyeye, & Ovienbor, 2019; Umar & Tusubira, 2017; Van Dijke, Gobena, & Verboon, 2019). However, these results were just focused on the positivity or negativity of these determining factors of tax compliance and nothing was said about the different extents to which these factors move citizens from being tax non-compliant, to being low tax compliant and eventually tax compliant. Perhaps, these results have not fully informed the government and policymakers on the factors that are most likely to improve tax compliance rates. As such, focus has been on less likely factors or less likely a combination of factors.

From the foregoing, it becomes crucial to assess Tax compliance of SMEs in Nigeria from the extent to which improved public goods and services will move taxpayers from being non-tax complaint and low tax compliant to being tax compliant. This study, therefore, uses the generalized ordered logistic regression to examine the likelihood of Tax compliance of SMEs in Nigeria when public goods are improved. The public good with the most impact on Tax compliance of SMEs in Nigeria will also be ascertained from the regression results as well as the predicted probability results and descriptive analysis. These results will help the government and policymakers revisit strategies for improving Tax compliance of SMEs and focus on them from the most impactful, bearing in mind how the effects actually work.

2. INSIGHTS FROM EXTANT STUDIES

Tax compliance is deciding to pay taxes for the benefit of society and at the expense of personal benefits (Van Dijke et al., 2019). It is the will of the taxpayer to act according to the spirit and letter of tax rules and regulations and tax administration without the use of coercion (José, Quesada, Tapia, & Llàcer, 2014; Newman et al., 2018). While Public goods are referred to as "non-rivalrous": because they do not reduce as persons consume them (Kenton, 2018). These goods are numerous and include public parks, national defence, public sewer systems, electricity, roads and other infrastructure necessary for the survival and growth of any business. These goods are financed publicly through such means as taxes (Ingham, 2015).

© 2020 AESS Publications. All Rights Reserved.

The definitions of Small and Medium Scale Enterprises (SMEs) varies across countries. According to the Central Bank of Nigeria-CBN (2005) SMEs are independent firms with 11 to 200 employees and has an asset base between N5-N500million excluding land and buildings (Ayuba et al., 2018).

2.1. Theoretical Review

2.1.1. Economic Deterrence Theory

As described by Allingham and Sandmo (1972) and Becker (1974) economic deterrence explains tax compliance with respect to tax rates, probability of being detected for evasion, and the penalties and threats of punishments (Ali, Fjeldstad, & Sjursen, 2013). The three principles of this theory are certainty; which represents a surety, severity; which represents the weight of punishment, and celerity; which means how fast these punishments would be given to defaulters. It should also be noted, however, that in the course of achieving this seamless tax collection process using deterrence, the taxpayers would try to test their chances of being caught. Where they find higher chances, they would then decide to go on ahead to comply, and where they find lower chances, they would look for loopholes to evade taxes (Feld & Frey, 2006; Sandmo, 2004). This is because the theory assumes that taxpayers' calculate the costs and opportunities of their actions before taking any actual decision. As such, the taxpayer is applying the economic rationale that makes them evade taxes as much as the payoff from evasion exceeds the supposed cost of being found non-compliant (Pfister, 2009).

2.1.2. Fiscal Social Contract

This theory is said to have sprung up and developed from the deterrence and socio-psychological theories. It is built on government and taxpayer contract embedded in social and relational factors (Fjeldstad et al., 2012; McKerchar & Evans, 2009). Fjeldstad et al. (2012) opined that the taxpayers engage in an exchange of their market purchasing power for government goods and services. However, the exchange is dependent on government authority and its varying performance. According to Timmons (2005) the conditions sufficient for the fulfilment of the fiscal social contract include the ability of the government to produce public goods so that each citizen does not have to do so themselves. Tax prices are to be set above the cost of producing public services so that the government can cover its cost. The enforcement of tax compliance through force must be more costly than producing goods, allowing gains to be obtained from trade. The existence of a probability that one of the citizens will play Tit-For-Tat (TFT); that is, responding to the demands of the government for taxation based on their performance.

2.2. Empirical and Methodological Review

In the qualitative research on the explanations to the issues facing developing countries with respect to the fiscal social contract of taxation, Umar and Tusubira (2017) conducted a semi-structured interview with self-employed business owners in Nigeria. It was concluded that Tax non-compliance is as a result of the people's dissatisfaction with the non-transparent tax system, the poor condition of socioeconomic goods, and the non-functioning of the tax audit system. On the other hand, Jolodar, Ahmadi, and Imankhan (2019) developed a tax compliance model using socio-psychological factors. A sample of 550 legal persons in Iran's Sari tax administration liable to pay Value Added Tax (VAT) was drawn from a population of 2900 legal persons. Using Structural Equation Modelling (SEM), it was concluded that given tax fairness, taxpayers' attitude, trust in the authorities, and tax morale, tax morale has the most impact on tax compliance. Non-pecuniary factors like tax knowledge limitation, non-compliance by other taxpayers, and corruption of the tax officials are key determinants of tax compliance in Sub-Saharan African (SSA) countries as indicated by Kamasa, Adu, and Oteng-Abayie (2019). This conclusion was made using the Afro Barometer round five (5) survey data, and the fiscal social contract was said to have more associations with tax compliance in countries with British origins.

© 2020 AESS Publications. All Rights Reserved.

Brockmann, Genschel, and Seelkopf (2016) examined the improvement of tax compliance from the perspective of giving positive rewards to active taxpayers. Using a controlled laboratory experiment, tax compliance was compared in light of deterrence and reward. It was concluded that rewards significantly affect tax compliance; however, this relationship is not straight forward. While women were seen improving their tax compliance, the men were not. Umar et al. (2019) examined the relationship between public governance quality and tax compliance behaviour in developing countries. Their conceptual paper was focused on socioeconomic conditions serving as a mediator between the government and the citizens, with emphasis on maintaining the fiscal social contract. It was concluded that dissatisfaction with the system leads to the boycott of the tax system and in turn, affects economic development. However, being a conceptual effort, they could not correctly explain socioeconomic conditions in all developing countries as these are country-specific characteristics. Also, the provision of goods and services influences taxpayers to comply with tax laws and tax obligations (Otusanya et al., 2019). This conclusion was made in their tax compliance research which employed Ordinary Least Squares (OLS) regression analysis to explain tax compliance of SMEs in Nigeria.

Furthermore, Nistotskaya and D'Arcy (2017) conducted exploratory research on why the tax compliance rate in Sweden is among the highest in the world. It was concluded that the early monitoring of economic activities and the development of a direct vertical and horizontal fiscal social contract between the state and the people had played an enormous role in Sweden's high tax compliance rate, despite the high tax rates. While Da Silva et al. (2019) compared voluntary and enforced tax compliance using the slippery slope framework in Brazil. Using a service paradigm, they proposed that taxpayers' willingness to pay taxes is as a result of their desire to receive proper treatment and quality public services in return for the taxes paid. The outcome of their study confirmed the existence of a trust-based interaction between the taxpayers and the government that boosts tax morale and tax compliance. Thus, as noted by Lamberton, De Neve, and Norton (2014) boosting tax morale and tax compliance is through giving the citizens voice on their choice of public goods and also being accountable as a government for what you use the tax money for. This conclusion was made in their study on tax compliance through eliciting taxpayers' preferences. Another outcome of the study was that allowing taxpayers' preference to show the distribution pattern of the government in terms of public goods will increase tax compliance by 15 per cent. However, Lee et al. (2019) explained firms' tax compliance in developing countries from the social exchange point of view. Employing multilevel logistic regression analysis, their study emphasised that the creation of social exchange between the firms and the government does not happen in a short space. Therefore, factors like bribery, tax burdens, as well as tax enforcement, are to be appropriately analysed.

2.3. Tax Compliance Strategies in Nigeria

In trying to achieve voluntary tax compliance among these SMEs in Nigeria, the presumptive taxation system has been put in place. The presumptive taxation system is used to predict taxpayers' income based on information about variables not considered in the standard computation of taxable income. This system takes into consideration the poor accounting of business information for auditing allows taxes to be collected from them (Egwaikhide, 2019). Despite its objective to increase overall revenue generated, it cannot be called a sustainable solution to the problem at hand. Taxpayers who typically comply with the rules will want to shift to this regime if they perceive the tax burden to be lower. Taxpayers will thus manipulate income declared and deliberately hide as SMEs to remain within the presumptive tax regime. This will, in turn, tamper with voluntary compliance and erode the actualization of improved revenue (Ebifuro, Mienye, & Odubo, 2016).

The Voluntary Assets Income Declaration Scheme (VAIDS) implemented in 2017 was put in place to improve the Nigerian tax base and reduce tax non-compliance. The focus was on persons with income above ₦1 billion and it yielded about ₦54 billion in paid tax and increased the overall tax revenue generated in 2018 to ₦5.32 trillion (Federal Inland Revenue Service-FIRS, 2018). However, the lack of enforcement after its completion killed any

© 2020 AESS Publications. All Rights Reserved.

adverse effect that it was meant to have on evasion as people still got away with not truthfully declaring their assets. The Voluntary Offshore Assets Regularisation Scheme (VOARS) launched in 2018 giving wealthy taxpayers a 12 months window to declare their offshore assets and pay the necessary taxes voluntarily has shown little or no enforcement evidence on the part of neither the government nor any form of eagerness on the part of the taxpayers (Adebiyi, Bamfo, & Isiadinso, 2019).

National tax policies contain a set of broad parameters for taxation as a whole. It describes principles and guidelines that govern tax administration and tax collection. The aim is to bring about fiscal responsibility and accountability, correct market failure, pursue fairness and equity, and provide economic stability, among others (Beecroft, Osabuohien, & Olurinola, 2018; Dike, 2014; Osabohien, Ufua, Moses, & Osabuohien, 2020). The 2016 NTP was published to simply the tax system, to provide ease of tax compliance, to provide new policies to improve the tax revenue to Gross Domestic Products (GDP) ratio, among others. The focus was to improve indirect taxes, review tax rates, create a competitive edge, and improve tax revenue generation in Nigeria.

Tax policies are good, but they require strong legal back up so that they can become tax laws. Tax laws are fundamental because they clearly state tax rates and stipulate sanctions for clearly stated tax offences. The most recent tax Act in Nigeria is the 2020 Public Finance Act, called "the Act"; signed on the 13th of January 2020 by President Muhammadu Buhari. Some of the significant changes contained in this Act, according to the Budget Office of the Budget Office of the Federation (2020) include:

- Application of excess dividend tax to only untaxed distributions other than profits exempted tax and investment income.
- Small business whose annual turnovers are less than ₦25 million will be exempted paying Company Income taxes (CIT).
- Medium-sized companies with annual turnovers between ₦25 million to ₦100 million will pay low CIT rates of 20 per cent.
- Modification of commencement and cessation rules to get rid of overlaps and gaps and avoid double taxation during commencement.
- There was an amendment of minimum tax provision to 0.5 per cent of annual turnover, with exemptions only for small businesses.
- Medium-sized companies now have 2 per cent bonus for early payments of CIT and a 1 per cent bonus for large companies.
- The requirement of Tax Identification Number (TIN) before bank accounts for individuals while existing account holders are required to provide their TIN for the continued operation of their account.
- Value Added Tax (VAT) registration threshold of ₦25 million as annual turnovers in a calendar year was made.
- Increase of VAT rate from 5 percent to 7.5 percent.

The 2020 Public Finance Act has five specific goals and objectives, which include improving government revenue through various fiscal measures, domestic tax law reforms and aligning them with global best practice. Others include ensuring fiscal equity by reducing instances of regressive taxation, provision of support to small businesses in line with Ease of Business Reforms and the provision of tax incentives for investments in infrastructure and capital market.

3. METHODOLOGY

3.1. Theoretical Framework

This study adopts the fiscal contract paradigm in Timmons (2005) research work on fiscal contract: states, taxes, and public services. This contract states that tax compliance in itself is a tool for regulating government activities and preferences because the citizens can hinder the government by holding back revenue. It is argued that

© 2020 AESS Publications. All Rights Reserved.

using bureaucracies to monitor and sanction non-taxpaying citizens is very costly (Fjeldstad et al., 2012). The government should, therefore, make tax compliance cost-effective by remaining committed to the citizens, give the people a voice over policies, provide them with goods of direct benefits, and invest in methods and beliefs that can be substituted for coercion. This, in turn, opens a door for an exchange-based government relationship in which the government sells services for revenue (Timmons, 2005). Therefore, in understanding taxpayers' behaviour and their unforced willingness to pay their taxes, it is possible to assume that the behaviour and attitude of the taxpayers are determined by satisfaction levels with the fiscal exchange with the government. Therefore, a wrong perception of the tax system may bring about tax non-compliance by the taxpayers, as an attempt to adjust the terms of trade with the government (Lenton, Masiye, & Mosley, 2017; Umar et al., 2019; Umar & Tusubira, 2017).

The conceptual framework for this study is obtained through the modification of the recommended framework in the tax compliance studies carried out by Umar et al. (2019); Lenton et al. (2017) and Timmons (2005).

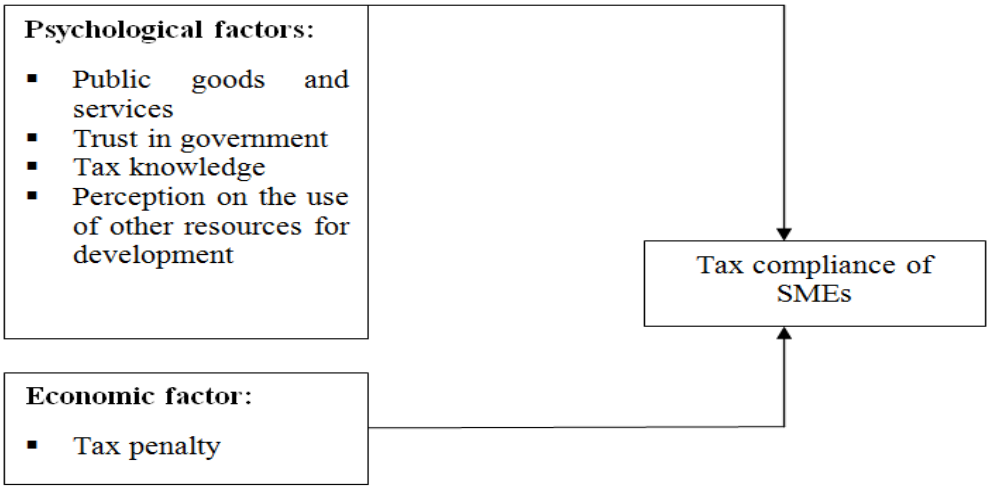

Figure-1. Schematic framework for Tax compliance of SMEs in Nigeria.

From 1, tax compliance of SMEs is obtained directly from either psychological factor, of which provision of public goods and services is included or through tax penalty; which is an economic factor.

3.2. Model Specification

To understand the effects of the provision of public goods on Tax compliance of SMEs in Nigeria, the model for this study is specified according to the adapted fiscal social contract by Timmons (2005). Therefore, the model is modified to suit the conceptual framework for this study and written its implicit form as follows:

$$TC = f\ (PG,, OR, T, TK, TP) \tag{1}$$

Where:

TC: Tax compliance.

PG: Improved public goods.

OR: Perception on government's use of other resources.

T: Trust in the government.

TK: Tax knowledge.

© 2020 AESS Publications. All Rights Reserved.

TP: Tax penalty.

Equation 1 can be re-written in its linear form such that:

$$Y_i = \beta_0 + \beta_1 PG_i + \beta_2 OR_i + \beta_3 T_i + \beta_4 TK_i + \beta_5 TP_i + \varepsilon_i \quad (2)$$

Where:

β_0: Intercept term.

$\beta_1, \beta_2, \beta_3, \beta_4$ *and* β_5: Slope coefficients.

ε_i: Error term.

3.3. Data and Estimation Technique

3.3.1. Data

This research utilized the 2018 Nigeria Economic Summit Group (NESG) quantitative survey dataset on firms' attitudes and perceptions towards tax compliance in Nigeria. The 8238 firms surveyed were small and were defined based on their sizes, according to the National Bureau of Statistics (NBS). Since most of the firms in the rural areas did not have up to 10 employees, the surveyed small firms used were defined as having employees between 5 and 49 employees. They were a combination of both registered and unregistered firms. The survey was conducted across the states in Nigeria and had an urban to a rural ratio of 70:30.

3.3.2. Estimation Technique

The study employs the generalised ordered logistic regression analysis to assess the role of improved public goods on Tax compliance of SMEs in Nigeria. This method is used when the outcome variable is ordinal and ranked, and when the outcome variable is ordinal and ranked. This methodology is used to relax the assumption of proportional odds as this study believes that the level of Tax compliance of SMEs varies as each explanatory variable increase. The SME is thus either tax non-compliant, low tax compliant or tax compliant. Given the response category of the dependent variable, SMEs that opine that tax non-compliance is not wrong at all are regarded as tax non-compliant. Those that assert that tax non-compliance is wrong but understandable are seen as low tax compliant, while those that state tax non-compliance is wrong and punishable are deemed tax compliant.

The Generalised Ordered Logistic model is specified according to Fullerton and Xu (2016) and McCullagh and Nelder (1989) such that:

$$P_r(y = z|X) = \begin{Bmatrix} F(\omega_1 - X\alpha_1) \\ F(\omega_z - X\alpha_z) - F(\omega_{z-1} - X\alpha_{z-1}) \\ 1 - F(\omega_{z-1} - X\alpha_{z-1}) \end{Bmatrix} \quad (3)$$

Where F is the logistic Cumulative Density Function (CDF);

α is a vector of logit coefficients that varies freely across logit equation;

X is a vector of explanatory variables;

ω is a cut-off point;

© 2020 AESS Publications. All Rights Reserved.

Z is the logit.

4. RESULTS AND DISCUSSIONS

4.1. Results

The results for this research are presented in two sets. The first set uses an indicator for overall improved public goods and combines it with the other explanatory variables. The second set, on the other hand, uses eight public goods and tax penalty to explain Tax compliance of SMEs in Nigeria and to ascertain which of these public goods have the most impact on tax compliance. The results of the generalised ordered logistic regression have two panels. The first panel contrasts SMEs that are tax non-compliant with SMEs that are less tax compliant or more tax compliant. While the second panel contrasts SMEs that are tax non-compliant and less tax compliant with SMEs that are more tax compliant. The positive coefficients depict the likelihood to fall into a higher category of tax compliance. In comparison, the negative coefficients depict a less probability of falling into a higher category of tax compliance. For the regression coefficients, only the signs are interpreted. The odds ratio shows the odds that SMEs will comply with taxes when the explanatory variable increases. This is measured by taking the ratio of the probability of tax compliance to the probability of tax non-compliance. The probability value of the Z test statistic, on the other hand, measures the statistical significance of each regression coefficients in explaining tax compliance. The null hypothesis that regression coefficients are not statistically significant is rejected at a 5 per cent level of significance. The Pseudo R squared is not interpreted like the R squared of linear regression analysis. Instead, it is used to compare models.

Table-1. First generalised ordered logistic regression.

Variables	Coefficients	Odds ratio	P-value
Not wrong at all			
Perception of not paying taxes until better services are provided	-0.121	0.886	0.005
Perception on the use of other resources to finance government projects	-0.193	0.824	0.000
Trust in government	0.131	1.141	0.000
Tax knowledge	0.098	1.103	0.019
Tax penalty	0.446	1.561	0.000
Wrong but understandable			
Perception of not paying taxes until better services are provided	-0.213	0.809	0.000
Perception on the use of other resources to finance government projects	-0.228	0.796	0.000
Trust in government	0.103	1.109	0.000
Tax knowledge	0.111	1.118	0.001
Tax penalty	0.906	2.474	0.000
P-LR Chi-square	0.000		
Pseudo R square	0.045		

The results in the first and second panel of Table 1 reveal that all the explanatory variables are statistically significant at 5 per cent in explaining Tax compliance of SMEs in Nigeria. The probability value of the likelihood ratio chi-square is also statistically significant at 5 per cent. Thus, this means that at least one of the regression coefficients in this model is not equal to zero. The test for multicollinearity displayed in Section 1of the appendices revealed the presence of no strong positive correlation between the explanatory variables.

In the first and second panel of Table 1 the negative regression coefficients for SMEs perception that taxes should not be paid until better services are given and that the government can use other resources instead of taxing firms it reveals a less likelihood of these factors to bring about tax compliance. While the positive regression coefficients for tax penalties, tax knowledge, and trust in government reveals a higher likelihood for tax compliance based on these factors.

© 2020 AESS Publications. All Rights Reserved.

For the odds ratio, tax penalty and tax knowledge increase the odds for tax compliance as movement is made from the first panel to the second panel, while a slight decrease is seen in the odds of tax compliance for trust in government. On the other hand, SMEs perception that tax should not be paid until better services are given and that the government can use other resources instead of taxing firms show a decrease in the odds of tax compliance.

Table-2. Predicted probabilities.

Tax compliance levels	PG	OR	T	TK	TP
Non-tax compliant	15%	15%	11%	12%	8%
Low tax compliant	59%	59%	57%	56%	49%
Tax compliant	26%	26%	33%	32%	43%

Where:

PG: Improved public goods

OR: Perception on government's use of other resources

T: Trust in the government

TK: Tax knowledge

TP: Tax penalty

The predicted probability results presented in Section 3 of the appendices revealed that all the predicted probabilities are statistically significant at 5 per cent. The results in Table 2 show that SMEs perception that taxes should not be paid until better services are provided and perception on the use of other resources to finance projects instead of taxing SMEs, has a higher percentage of making SMEs low tax compliant, than being tax compliant or non-tax compliant. Also, greater trust in government, improved tax knowledge and greater tax penalty have a higher percentage to leave SMEs as low tax compliant than being tax compliant.

Table-3. Second generalised ordered logistic regression.

Variables	Coefficient	Odds ratio	P-value
Not wrong at all			
Improved telecommunication	-0.136	0.871	0.042
Improved electricity	-0.049	0.952	0.460
Improved public transport	-0.079	0.923	0.290
Improved financial institution	-0.087	0.916	0.233
Improved court of law	-0.055	0.946	0.453
Improved labour regulation	0.081	1.085	0.270
Improved roads	0.189	1.208	0.006
Improved security	0.253	1.288	0.000
Tax penalty	0.592	1.652	0.000
Wrong but understandable			
Improved telecommunication	-0.036	0.965	0.500
Improved electricity	-0.021	0.979	0.685
Improved public transport	0.014	1.149	0.017
Improved financial institution	0.118	1.017	0.758
Improved court of law	0.144	1.154	0.013
Improved labour regulation	0.003	1.003	0.956
Improved roads	-0.014	0.986	0.803
Improved security	-0.028	1.015	0.779
Tax penalty	0.870	2.388	0.000
P-LR Chi-square	0.000		
Pseudo R square	0.004		

Table 3 contains several statistically insignificant negative regression coefficients. This analysis was conducted to see the extent to which improving each public goods and services will improve Tax compliance of SMEs. In the first panel, only improved telecommunication, roads and security are statistically significant at 5 per cent and positive in explaining Tax compliance of SMEs in Nigeria. While in the second panel, only improved law court and

© 2020 AESS Publications. All Rights Reserved.

public transport are statistically significant. These two variables also have positive signs and thus depict a likelihood of Tax compliance of SMEs. This, therefore, means that in moving SMEs from being tax non-compliant to being low tax compliant or tax compliant, the essential variables are improved telecommunications, roads and security. While to move SMEs from being tax non-compliant or low tax compliant to being tax compliant, the critical factors are improved law court and public transport.

Table-4. Predicted probabilities.

Tax compliance levels	Telecomm	Roads	Security	Law court	Public transport
Non-tax compliant	15%	13%	13%	12%	13%
Low tax compliant	57%	56%	56%	56%	56%
Tax compliant	28%	30%	31%	31%	31%

The results in Table 4 selected the predicted probabilities of only the statistically significant factors in Table 3. It is revealed from Table 4 that employing improved telecommunications, roads and security to move SMEs from being tax non-compliant to being either low tax compliant or tax compliant more of the SMEs will fall in the category of low tax compliance. Also, when an improved court of law and public transport are being employed to move SMEs from being tax non-compliant and low tax compliant to becoming tax compliant, majority of the SMEs will remain low tax compliant. From this result also, it is revealed that improved security, law courts and public transport have the most likelihood to make SMEs tax compliant.

4.2. Summary of Findings

This study found a positive relationship between improved public goods and services and Tax compliance of SMEs in Nigeria. This finding is in line with the empirical studies of Umar and Tusubira (2017) and Lee et al. (2019). Also, the findings on the positive relationship between Tax compliance of SMEs and trust in government as well as tax knowledge and tax penalty are in accordance with theoretical postulations of Allingham and Sandmo (1972) and Feld and Frey (2006). It also corroborates the results of Umar and Tusubira (2017); Jolodar et al. (2019) and Kamasa et al. (2019).

However, being that improving public services requires large funds and investments, the Nigerian government and policymakers can start with improving security, law courts and public transportation. Also, all the economic and psychological factors used in this study have shown that a small increase in these factors will have the most effect on moving tax non-compliant SMEs to become low tax compliant. Therefore, in addressing the issue of tax non-compliance among SMEs, time for strategies to yield the desired objectives should be put into consideration, and hasty decisions should not be made.

5. CONCLUSION AND RECOMMENDATIONS

The primary goal of this study was to assess the likelihood of Tax compliance of SMEs in Nigeria when public goods are improved. Also, the public goods with the most impact on Tax compliance of SMEs in Nigeria was established; given the present conditions of SMEs and the level of trust between the government and the citizens. The findings revealed the likelihood of Tax compliance of SMEs to improve in Nigeria when public goods are improved. It also revealed the importance of improving SME tax knowledge, as well as tax penalties in determining tax compliance in Nigeria. The perception of SMEs that the government can use other resources to finance projects instead of taxing firms also plays a significant negative role in determining tax compliance levels. Furthermore, investment in security, public transportation and law courts can be a starting point for improving public goods in Nigeria, being that they have the most impact on tax compliance.

It is, therefore, worrisome that the allocations of the annual budgets to these socioeconomic goods are still very low. The tax laws already in place to govern the overall Nigerian tax system are very important. However, to

© 2020 AESS Publications. All Rights Reserved.

harness the benefits of these tax laws, reduce tax compliance costs, and achieve an improved domestic revenue generation in Nigeria, the Nigerian government and policymakers are advised to take steps to improve the allocation of government expenditure to public goods and services required for the survival and growth of SMEs. Also, efforts should be made to improve taxpayers' education and tax knowledge.

Furthermore, bearing in mind that getting the people to comply with taxes takes some time even when quality goods and services are being provided, the policymakers in developing countries, Nigeria inclusive can start by focusing on tax compliance that has higher tax compliance likelihood, as revealed in the findings of this research.

The importance of strengthened and improved government institutions cannot be overemphasised. It is important for tax laws to be in place. However, these laws are adhered to concerning the guiding and governing institutions for its enforcement. The government in developing countries should, therefore, deepen the quality of tax institutions and give stronger punishments for tax non-compliance. This will, in turn, reduce the ease at which small businesses evade taxes since they would be more conscious of the repercussions for being caught.

Funding: This study received no specific financial support.
Competing Interests: The authors declare that they have no competing interests.
Acknowledgement: The authors thank Covenant University for defraying the cost of publishing the manuscript through its Covenant University Centre for Research, Innovation and Discoveries (CUCRID). The authors appreciate the useful comments from the anonymous reviewers. Also, the Equipment Subsidy Grant awarded by the Alexander von Humboldt Foundation [REF: 3.4-8151/19047] to the Centre for Economic Policy and Development Research (CEPDeR), Covenant University that facilitated the revision of the paper is acknowledged. The views expressed are those of the authors.

REFERENCES

Adebiyi, O., Bamfo, J., & Isiadinso, O. (2019). Nigeria: Nigerian tax & fiscal outlook. Retrieved from https://www.mondaq.com/Nigerian+Tax+FIscal+Outlook+2019. [Accessed April 4, 2019].

Adeleye, N., Osabuohien, E., Bowale, E., Matthew, O., & Oduntan, E. (2018). Financial reforms and credit growth in Nigeria: Empirical insights from ARDL and ECM techniques. *International Review of Applied Economics*, *32*(6), 807-820.

Adeleye, N., Osabuohien, E., & Asongu, S. (2020). Agro-industrialisation and financial intermediation in Nigeria. *African Journal of Economic and Management Studies*.Available at: https://doi.org/10.1108/AJEMS-02-2019-0078.

Alasfour, F. (2019). Costs of distrust: The virtuous cycle of tax compliance in Jordan. *Journal of Business Ethics*, *155*(1), 243-258.Available at: https://doi.org/10.1007/s10551-017-3473-y.

Ali, M., Fjeldstad, O. H., & Sjursen, I. H. (2013). *Factors affecting tax compliant attitude in Africa: Evidence from Kenya, Tanzania, Uganda and South Africa*. Paper presented at the In Centre for the Study of African Economies 2013 Conference, Oxford University.

Allingham, M. G., & Sandmo, A. (1972). Income tax evasion: A theoretical analysis. *Journal of Public Economics*, *1*(3-4), 323-338.Available at: https://doi.org/10.1016/0047-2727(72)90010-2

Ayuba, A., Saad, N., & Ariffin, Z. Z. (2018). Testing the assumptions of slippery slope framework on tax compliance: Evidence from Nigerian SMEs. *DLSU Business & Economics Review*, *27*(2), 166-178.

Becker, G. (1974). A theory of social interactions. *Journal of Political Economy*, *76*(12), 167-217.

Beecroft, I., Osabuohien, E. S., & Olurinola, I. O. (2018). Institutions, fiscal performance and development trajectories in ECOWAS: Implications for sustainability (pp. 121-141). In U.R. Efobi& S. Asongu (Eds.) Financing Sustainable Development in Africa.

Bird, R., & Davis-Nozemack, K. (2018). Tax avoidance as a sustainability problem. *Journal of Business Ethics*, *151*(4), 1009-1025.Available at: https://doi.org/10.1007/s10551-016-3162-2.

Brockmann, H., Genschel, P., & Seelkopf, L. (2016). Happy taxation: Increasing tax compliance through positive rewards? *Journal of Public Policy*, *36*, 381-406.Available at: https://doi.org/10.1017/s0143814x15000331.

© 2020 AESS Publications. All Rights Reserved.

Bucci, V. (2019). Presumptive taxation methods: A review of the empirical literature. *Journal of Economic Surveys*, *34*(2), 372-397.Available at: https://doi.org/10.1111/joes.12304.

Budget Office of the Federation. (2020). Retrieved from: https://budgetoffice.gov.ng/index.php/highlights-breakdown-of-the-2020-approved-budget/highlights-breakdown-of-the-2020-approved-budget/download. [Accessed February 14, 2020].

Central Bank of Nigeria-CBN. (2005). The conduct of fiscal policy. Retrieved from https://www.cbn.gov.ng/MonetaryPolicy/Fiscal/2005.asp. [Accessed June 30, 2020].

Da Silva, F. P., Guerreiro, R., & Flores, E. (2019). Voluntary versus enforced tax compliance: The slippery slope framework in the Brazilian context. *International Review of Economics*, *66*(2), 147-180.Available at: https://doi.org/10.1007/s12232-019-00321-0.

Dike, M. A. C. (2014). *An overview of the Nigerian tax system; implications for foreign investors*. Paper presented at the Nigerians in Diaspora Organization (NIDO). UK South Investment Conference on the 17th – 18th of March.

Ebifuro, O., Mienye, E., & Odubo, T. V. (2016). Application of GIS in improving tax revenue from the informal sector in Bayelsa State, Nigeria. *International Journal of Scientific and Research Publication*, *6*(8), 2250-3153.

Efobi, U. R., Beecroft, I., & Osabuohien, E. S. (2014). Access to and use of bank services in Nigeria: Micro-econometric evidence. *Review of Development Finance*, *4*(2), 104-114.Available at: https://doi.org/10.1016/j.rdf.2014.05.002.

Egwaikhide. (2019). Nigeria's low tax collection and poor quality of government expenditure: Political and administrative impediments to improvement. CGD Policy Paper 162. Washington, DC: Center for Global Development.

Federal Inland Revenue Service-FIRS. (2018). Retrieved from https://www.firs.gov.ng/PressReleasePresidentBuhari.

Feld, L., & Frey, B. (2006). Tax compliance as the result of a psychological tax contract: The role of incentives and responsive regulation. *Law and Policy*, *15*(1), 102-120.

Fjeldstad, O.-H., Schulz-Herzenberg, C., & Hoem Sjursen, I. (2012). People's views of taxation in Africa: A review of research on determinants of tax compliance.

Fullerton, A. S., & Xu, J. (2016). Ordered regression models: Parallel, partial, and non-parallel alternatives. *International Statistical Review*, *84*(3), 550-551.Available at: https://doi.org/10.1111/insr.12199.

Gaspar, V., Amaglobeli, M. D., Garcia-Escribano, M. M., Prady, D., & Soto, M. (2019). *Fiscal policy and development: Human, Social, and physical investments for the SDGs: International Monetary Fund-SDN 19/03. Retrieved from https://www.elibrary.imf.org/doc/IMF006/25654-9781484388914/25654-9781484388914/Other_formats/Source_PDF/25654-9781484394441.pdf?redirect=true. [Accessed June 28, 2020].*

George, T. O., Olayiwola, W. K., Adewole, M., & Osabuohien, E. S. (2013). Effective service delivery of Nigeria's public primary education: The role of Non-State actors. *Journal of African Development*, *15*(1), 221-245.

Gobena, L. B., & Van Dijke, M. (2017). Fear and caring: Procedural justice, trust, and collective identification as antecedents of voluntary tax compliance. *Journal of Economic Psychology*, *62*, 1-16.Available at: https://doi.org/10.1016/j.joep.2017.05.005.

Gupta, S., & Plant, M. (2019). Enhancing domestic resource mobilization: What are the real obstacles?

Ingham, S. (2015). Public goods and private goods. *Britannica.com*.

International Monetary Fund Fiscal Monitor. (2018). Capitalizing on the good times. Retrieved from www.imfconnect.org/content/dam/imf/Spring-Annual%20Meetings/SM18/Documents%20and%20Publications/fm1801.pdf.

Jolodar, S. Y. E., Ahmadi, M., & Imankhan, N. (2019). Presenting the model of tax compliance: The role of internal and psychologival factors. *Asia-Pacific Management Accounting Journal*, *14*(2), 139-160.

José, N. A., Quesada, F. J. M., Tapia, E., & Llàcer, T. (2014). Tax compliance, rational choice, and social influence: An agent-based model. *French Journal of Sociology*, *55*(4), 765-804.Available at: https://doi.org/10.3917/rfs.554.0765.

Kamasa, K., Adu, G., & Oteng-Abayie, E. F. (2019). Tax compliance in Sub-Saharan Africa: How important are non-pecuniary factors? *African Journal of Economic Review*, *7*(1), 154-175.

© 2020 AESS Publications. All Rights Reserved.

Kangave, J., Nakato, S., Waiswa, R., Nalukwago, M., & Zzimbe, P. (2018). What can we learn from the uganda revenue authority's approach to taxing high net worth individuals? ICTD Working Paper No.72.

Kasum, A. S., Sanni, A. K., & Fagbemi, T. O. (2019). Tax revenue generation by Nigerian States-An empirical study of self-assessment and tax-collection contracting systems in Kwara State. *Global Journal of Accounting*, *5*(1), 27-36.

Kenton, W. (2018). Public goods versus private goods. *Scientific Papers of the University of Pardubice. Series D, Faculty of Economics and Administration. 4532018.*

Lamberton, C. P., De Neve, J.-E., & Norton, M. I. (2014). Eliciting taxpayer preferences increases tax compliance. *Available at SSRN 2365751.*

Lee, S.-H., Gokalp, O. N., & Kim, J. (2019). Firm–government relationships: A social exchange view of corporate tax compliance. *Global Strategy Journal.*Available at: https://doi.org/10.1002/gsj.1340.

Lenton, P., Masiye, M., & Mosley, P. (2017). Taxpayer's dilemma: How can 'fiscal contracts' work in developing countries? *Sheffield Economics Research Papers (SERPS), No. 201700(2017004).*

Matthew, O., Miebaka-Ogan, T., Popoola, O., Olawande, T., Osabohien, R., Urhie, E., . . . Ogunbiyi, T. (2019). Electricity consumption, government expenditure and sustainable development in Nigeria: A co-integration approach. *International Journal of Energy Economics and Policy*, *9*(4), 74-80.Available at: https://doi.org/10.32479/ijeep.7547.

McCullagh, P., & Nelder, J. A. (1989). *Generalized linear models.* New York: CRC Monographs on Statistics & Applied Probability, Springer Verlag.

McKerchar, M., & Evans, C. (2009). Sustaining growth in developing economies through improved taxpayer compliance: Challenges for policy makers and revenue authorities. *EJTR*, *7*, 171.

Newman, W., Mwandambira, N., Charity, M., & Ongayi, W. (2018). Literature review on the impact of tax knowledge on tax compliance among small medium enterprises in a developing country. *International Journal of Entrepreneurship*, *22*(4), 1-15.

Nistotskaya, M., & D'Arcy, M. (2017). Getting to Sweden: The origins of high tax compliance in the Swedish tax state. The leap of faith: The fiscal foundations of successful government in Europe and America.

Obara, L. C., & Nangih, E. (2017). Taxing the informal sector and revenue generation in developing countries: An empirical investigation from rivers State of Nigeria. *Journal of Accounting and Financial Management*, *3*(1), 47-55.

Okorie, U. E., Osabuohien, E. S., & Oaikhenan, H. E. (2020). Electricity consumption, public agricultural expenditure and output in Nigeria: A time series dynamic approach. *International Journal of Energy Economics and Policy*, *10*(2), 113-123.Available at: https://doi.org/10.32479/ijeep.8436.

Olaitan, V. (2016). The informal sector and tax revenue drive: A Nigerian case study.

Osabohien, R., Ufua, D., Moses, C. L., & Osabuohien, E. (2020). Accountability in agricultural governance and food security in Nigeria. *Brazilian Journal of Food Technology*, *23*.Available at: https://doi.org/10.1590/1981-6723.08919.

Otusanya, J. O., Adeyeye, B. G., & Ovienbor, L. (2019). Informal sector taxpayers' perception of influence of government accountability on voluntary tax compliance and the moderating role of fiscal exchange. *ICAN Journal of Accounting & Finance*, *8*(2), 1-20.

Pfister, M. (2009). *Taxation for Investment and development: An overview of policy challenges in Africa*. Paper presented at the Ministerial Meeting and Expert Roundtable. NEPAD – OECD. African Investment Initiative.

Prichard, W., Lustig, N., Gupta, S., Krafchik, W., Gary, I., & Coulibaly, B. (2019). Tax to finance the SDGs, but not to undermine them. Retrieved from https://www.brookings.edu/blog/africa-in-focus/2019/07/01/tax-to-finance-the-sdgs-but-not-to-undermine-them/. [Accessed June 29, 2020].

Sandmo, A. (2004). The theory of tax evasion: A retrospective view. Norwegian school of economics and business administration: Discussion Paper 31/04.

Slemrod, J. (2019). Tax compliance and enforcement. *Journal of Economic Literature*, *57*(4), 904-954.

Timmons, J. F. (2005). The fiscal contract: States, taxes, and public services. *World Politics*, *57*(4), 530-567.

© 2020 AESS Publications. All Rights Reserved.

Traoré, M. (2018). Government spending and inclusive growth in Sub-Saharan Africa: A panel VAR analysis. Studies and Documents, n ° 15, CERDI.

Udoh, E. (2015). Taxing the informal economy in Nigeria: Issues, challenges and opportunities. *International Journal of Business and Social Science, 6*(10), 160-169.

Umar, M. A., Derashid, C., Ibrahim, I., & Bidin, Z. (2019). Public governance quality and tax compliance behavior in developing countries: The mediating role of socioeconomic conditions. *International Journal of Social Economics, 46*(3), 338-351.Available at: https://doi.org/10.1108/ijse-11-2016-0338.

Umar, M. A., & Tusubira, N. F. (2017). Challenges of tax administration in developing countries: Insights from the 5th annual tax administration research centre workshop, 2017. *Journal of Tax Administration, 3*(2), 108-123.

United Nations. (2017). Sustainable development goals Report. United Nations Secretary General. Retrieved from https://www.un.org/development/desa/publications/sdg-report-2017.html. [Accessed June 28, 2020].

Van Dijke, M., Gobena, L. B., & Verboon, P. (2019). Make me want to pay. A three-way interaction between procedural justice, distributive justice, and power on voluntary tax compliance. *Frontiers in Psychology, 10*(7), 1–15.Available at: https://doi.org/10.3389/fpsyg.2019.01632.

World Bank. (2018). Domestic resource mobilization. Retrieved from: https://www.worldbank.org/en/topic/governance/brief/domestic-resource-mobilization. [Accessed February 2, 2020].

APPENDICES

Section-1. Test for Multicolinearity

```
. estat vce, correlation

Correlation matrix of coefficients of ologit model
```

	q21					cut1	cut2
e(V)	q23b	q29d	q54a	q61	q22e	_cons	_cons
q21							
q23b	1.0000						
q29d	0.0664	1.0000					
q54a	0.0021	-0.0754	1.0000				
q61	0.0196	-0.0057	0.0106	1.0000			
q22e	-0.2589	0.0883	-0.0102	-0.0144	1.0000		

```
. estat vce, correlation

Correlation matrix of coefficients of ologit model
```

	q21									cut1	cut2
e(V)	q26a	q26b	q26c	q26d	q26e	q26f	q26g	q26h	q61	_cons	_cons
q21											
q26a	1.0000										
q26b	-0.2473	1.0000									
q26c	-0.2419	-0.0901	1.0000								
q26d	-0.1035	-0.0550	-0.2587	1.0000							
q26e	-0.1328	0.0108	-0.0903	-0.3180	1.0000						
q26f	-0.0573	-0.0296	-0.1470	-0.1358	-0.3705	1.0000					
q26g	-0.0251	-0.2222	-0.1226	-0.0626	-0.0322	-0.1091	1.0000				
q26h	-0.0701	-0.2356	-0.0381	-0.0239	0.0240	-0.0230	-0.3835	1.0000			
q61	-0.0285	-0.0219	-0.0077	-0.0053	0.0139	-0.0370	0.0087	0.0180	1.0000		

© 2020 AESS Publications. All Rights Reserved.

Section-2. Generalized Ordered Logistic Regression Result

```
Generalized Ordered Logit Estimates              Number of obs   =       6762
                                                 LR chi2(10)     =     586.21
                                                 Prob > chi2     =     0.0000
Log likelihood = -6270.1575                      Pseudo R2       =     0.0447
```

q21	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
1_ Not wrong at all						
q23b	-.1930942	.0476811	-4.05	0.000	-.2865474	-.099641
q29d	.1314677	.0359844	3.65	0.000	.0609396	.2019957
q54a	.0983779	.0419009	2.35	0.019	.0162536	.1805022
q61	.445611	.0567995	7.85	0.000	.334286	.5569359
q22e	-.1213788	.0428714	-2.83	0.005	-.2054052	-.0373524
_cons	1.063341	.224666	4.73	0.000	.6230042	1.503679
2_ Wrong but understandable						
q23b	-.2276283	.0336024	-6.77	0.000	-.2934877	-.1617689
q29d	.1034505	.0277718	3.73	0.000	.0490188	.1578822
q54a	.1114478	.033764	3.30	0.001	.0452716	.1776241
q61	.9056411	.0481827	18.80	0.000	.8112048	1.000077
q22e	-.2125497	.032295	-6.58	0.000	-.2758467	-.1492527
_cons	-2.346383	.1809546	-12.97	0.000	-2.701047	-1.991718

```
. gologit2 q21  q23b q29d  q54a q61 q22e, or

Generalized Ordered Logit Estimates              Number of obs   =       6762
                                                 LR chi2(10)     =     586.21
                                                 Prob > chi2     =     0.0000
Log likelihood = -6270.1575                      Pseudo R2       =     0.0447
```

q21	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
1_ Not wrong at all						
q23b	.8244043	.0393085	-4.05	0.000	.7508515	.9051623
q29d	1.140501	.0410402	3.65	0.000	1.062835	1.223843
q54a	1.10338	.0462326	2.35	0.019	1.016386	1.197819
q61	1.561444	.0886892	7.85	0.000	1.396943	1.745316
q22e	.8856984	.0379711	-2.83	0.005	.8143173	.9633366
_cons	2.896032	.6506398	4.73	0.000	1.864521	4.498206
2_ Wrong but understandable						
q23b	.7964202	.0267616	-6.77	0.000	.7456584	.8506378
q29d	1.108991	.0307987	3.73	0.000	1.05024	1.171028
q54a	1.117895	.0377446	3.30	0.001	1.046312	1.194376
q61	2.473517	.1191806	18.80	0.000	2.250618	2.718492
q22e	.8085201	.0261112	-6.58	0.000	.7589292	.8613515
_cons	.0957147	.01732	-12.97	0.000	.0671352	.1364607

© 2020 AESS Publications. All Rights Reserved.

Generalized Ordered Logit Estimates — Number of obs = 6257; LR chi2(18) = 448.10; Prob > chi2 = 0.0000; Log likelihood = -5881.3549; Pseudo R2 = 0.0367

q21	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
1_ Not wrong at all						
q26a	-.1385686	.0680343	-2.04	0.042	-.2719133	-.0052239
q26b	-.0489971	.0663762	-0.74	0.460	-.1790921	.0810979
q26c	-.0792403	.0749158	-1.06	0.290	-.2260727	.067592
q26d	-.0873299	.0732771	-1.19	0.233	-.2309503	.0562906
q26e	-.0554153	.0738293	-0.75	0.453	-.2001181	.0892876
q26f	.0813561	.0737219	1.10	0.270	-.0631363	.2258484
q26g	.1892835	.068847	2.75	0.006	.0543459	.3242212
q26h	.2532257	.0638061	3.97	0.000	.128168	.3782834
q61	.5022316	.0589324	8.52	0.000	.3867263	.6177369
_cons	.4130625	.1663595	2.48	0.013	.087004	.7391211
2_ Wrong but understandable						
q26a	-.0361186	.0535766	-0.67	0.500	-.1411269	.0688897
q26b	-.021411	.052716	-0.41	0.685	-.1247325	.0819105
q26c	.1387643	.0583469	2.38	0.017	.0244064	.2531222
q26d	.0176774	.0573903	0.31	0.758	-.0948055	.1301602
q26e	.1440799	.0577606	2.49	0.013	.0308711	.2572886
q26f	.0031003	.0562618	0.06	0.956	-.1071708	.1133715
q26g	-.0135824	.0543411	-0.25	0.803	-.120089	.0929242
q26h	.0144045	.051266	0.28	0.779	-.086075	.114884
q61	.8703092	.0491274	17.72	0.000	.7740213	.9665971
_cons	-3.19392	.1512964	-21.11	0.000	-3.490455	-2.897384

Generalized Ordered Logit Estimates — Number of obs = 6257; LR chi2(18) = 448.10; Prob > chi2 = 0.0000; Log likelihood = -5881.3549; Pseudo R2 = 0.0367

q21	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
1_ Not wrong at all						
q26a	.8706035	.0592309	-2.04	0.042	.7619203	.9947897
q26b	.9521839	.0632024	-0.74	0.460	.8360289	1.084477
q26c	.9238179	.0692086	-1.06	0.290	.7976601	1.069929
q26d	.9163748	.0671493	-1.19	0.233	.7937789	1.057905
q26e	.9460922	.0698494	-0.75	0.453	.818634	1.093395
q26f	1.084757	.0799704	1.10	0.270	.9388155	1.253386
q26g	1.208384	.0831936	2.75	0.006	1.05585	1.382953
q26h	1.288174	.0821934	3.97	0.000	1.136744	1.459777
q61	1.652405	.0973801	8.52	0.000	1.472153	1.854726
_cons	1.51144	.2514423	2.48	0.013	1.090901	2.094094
2_ Wrong but understandable						
q26a	.9645259	.0516761	-0.67	0.500	.8683791	1.071318
q26b	.9788166	.0515993	-0.41	0.685	.882733	1.085359
q26c	1.148853	.0670321	2.38	0.017	1.024707	1.288041
q26d	1.017835	.0584138	0.31	0.758	.9095498	1.139011
q26e	1.154976	.0667122	2.49	0.013	1.031353	1.293418
q26f	1.003105	.0564366	0.06	0.956	.8983722	1.120048
q26g	.9865094	.053608	-0.25	0.803	.8868415	1.097379
q26h	1.014509	.0520098	0.28	0.779	.9175254	1.121743
q61	2.387649	.117299	17.72	0.000	2.168469	2.628983
_cons	.0410108	.0062048	-21.11	0.000	.030487	.0551673

© 2020 AESS Publications. All Rights Reserved.

Section-3. *Result for Predicted Probabilities*

```
. margins, predict (outcome (1)) at (q22e=3) atmeans

Adjusted predictions                            Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==1), predict(outcome (1))
at           : q23b            =    2.412896 (mean)
               q29d            =    2.098492 (mean)
               q54a            =    2.560041 (mean)
               q61             =    2.123928 (mean)
               q22e            =           3
```

	Delta-method					
	Margin	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_cons	.1512817	.0052205	28.98	0.000	.1410497	.1615137

```
. margins, predict (outcome (2)) at (q22e=3) atmeans

Adjusted predictions                            Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==2), predict(outcome (2))
at           : q23b            =    2.412896 (mean)
               q29d            =    2.098492 (mean)
               q54a            =    2.560041 (mean)
               q61             =    2.123928 (mean)
               q22e            =           3
```

	Delta-method					
	Margin	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_cons	.5894687	.0065068	90.59	0.000	.5767156	.6022219

```
. margins, predict (outcome (3)) at (q22e=3) atmeans

Adjusted predictions                            Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==3), predict(outcome (3))
at           : q23b            =    2.412896 (mean)
               q29d            =    2.098492 (mean)
               q54a            =    2.560041 (mean)
               q61             =    2.123928 (mean)
               q22e            =           3
```

	Delta-method					
	Margin	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_cons	.2592496	.0068771	37.70	0.000	.2457707	.2727285

© 2020 AESS Publications. All Rights Reserved.

```
. margins, predict (outcome (1)) at (q23b=3) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==1), predict(outcome (1))
at           : q23b            =           3
               q29d            =    2.098492 (mean)
               q54a            =    2.560041 (mean)
               q61             =    2.123928 (mean)
               q22e            =    2.235138 (mean)
```

	Delta-method					
	Margin	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_cons	.1499865	.0049476	30.32	0.000	.1402894	.1596835

```
. margins, predict (outcome (2)) at (q23b=3) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==2), predict(outcome (2))
at           : q23b            =           3
               q29d            =    2.098492 (mean)
               q54a            =    2.560041 (mean)
               q61             =    2.123928 (mean)
               q22e            =    2.235138 (mean)
```

	Delta-method					
	Margin	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_cons	.5888151	.0064569	91.19	0.000	.5761598	.6014704

```
. margins, predict (outcome (3)) at (q23b=3) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==3), predict(outcome (3))
at           : q23b            =           3
               q29d            =    2.098492 (mean)
               q54a            =    2.560041 (mean)
               q61             =    2.123928 (mean)
               q22e            =    2.235138 (mean)
```

	Delta-method					
	Margin	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_cons	.2611984	.0064642	40.41	0.000	.2485289	.2738679

© 2020 AESS Publications. All Rights Reserved.

```
. margins, predict (outcome (1)) at (q29d=4) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==1), predict(outcome (1))
at           : q23b            =    2.412896 (mean)
               q29d            =           4
               q54a            =    2.560041 (mean)
               q61             =    2.123928 (mean)
               q22e            =    2.235138 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .1118528    .005893    18.98   0.000     .1003027    .1234029
------------------------------------------------------------------------------

. margins, predict (outcome (2)) at (q29d=4) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==2), predict(outcome (2))
at           : q23b            =    2.412896 (mean)
               q29d            =           4
               q54a            =    2.560041 (mean)
               q61             =    2.123928 (mean)
               q22e            =    2.235138 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .5568895   .0083014    67.08   0.000      .540619      .57316
------------------------------------------------------------------------------

. margins, predict (outcome (3)) at (q29d=4) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==3), predict(outcome (3))
at           : q23b            =    2.412896 (mean)
               q29d            =           4
               q54a            =    2.560041 (mean)
               q61             =    2.123928 (mean)
               q22e            =    2.235138 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .3312577   .0117207    28.26   0.000     .3082855    .3542299
------------------------------------------------------------------------------
```


© 2020 AESS Publications. All Rights Reserved.

```
. margins, predict (outcome (1)) at (q54=4) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==1), predict(outcome (1))
at           : q23b            =    2.412896 (mean)
               q29d            =    2.098492 (mean)
               q54a            =           4
               q61             =    2.123928 (mean)
               q22e            =    2.235138 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .1175891   .0057943    20.29   0.000     .1062326    .1289457
------------------------------------------------------------------------------

. margins, predict (outcome (2)) at (q54=4) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==2), predict(outcome (2))
at           : q23b            =    2.412896 (mean)
               q29d            =    2.098492 (mean)
               q54a            =           4
               q61             =    2.123928 (mean)
               q22e            =    2.235138 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .5635464   .0077965    72.28   0.000     .5482655    .5788273
------------------------------------------------------------------------------

. margins, predict (outcome (3)) at (q54=4) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==3), predict(outcome (3))
at           : q23b            =    2.412896 (mean)
               q29d            =    2.098492 (mean)
               q54a            =           4
               q61             =    2.123928 (mean)
               q22e            =    2.235138 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .3188645   .0107869    29.56   0.000     .2977225    .3400065
------------------------------------------------------------------------------
```


© 2020 AESS Publications. All Rights Reserved.

```
. margins, predict (outcome (1)) at (q61=3) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==1), predict(outcome (1))
at           : q23b            =    2.412896 (mean)
               q29d            =    2.098492 (mean)
               q54a            =    2.560041 (mean)
               q61             =           3
               q22e            =    2.235138 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .0755892   .0037931    19.93   0.000     .0681549    .0830235
------------------------------------------------------------------------------

. margins, predict (outcome (2)) at (q61=3) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==2), predict(outcome (2))
at           : q23b            =    2.412896 (mean)
               q29d            =    2.098492 (mean)
               q54a            =    2.560041 (mean)
               q61             =           3
               q22e            =    2.235138 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .4916542   .0083312    59.01   0.000     .4753254     .507983
------------------------------------------------------------------------------

. margins, predict (outcome (3)) at (q61=3) atmeans

Adjusted predictions                              Number of obs   =       6762
Model VCE    : OIM

Expression   : Pr(q21==3), predict(outcome (3))
at           : q23b            =    2.412896 (mean)
               q29d            =    2.098492 (mean)
               q54a            =    2.560041 (mean)
               q61             =           3
               q22e            =    2.235138 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .4327566   .0104165    41.55   0.000     .4123406    .4531725
------------------------------------------------------------------------------
```


© 2020 AESS Publications. All Rights Reserved.

```
. margins, predict (outcome (1)) at (q26h=3) atmeans

Adjusted predictions                              Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==1), predict(outcome (1))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =           3
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .1317432   .0055488    23.74   0.000     .1208678    .1426186
------------------------------------------------------------------------------

. margins, predict (outcome (2)) at (q26h=3) atmeans

Adjusted predictions                              Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==2), predict(outcome (2))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =           3
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .5599249   .0071325    78.50   0.000     .5459456    .5739043
------------------------------------------------------------------------------

. margins, predict (outcome (3)) at (q26h=3) atmeans

Adjusted predictions                              Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==3), predict(outcome (3))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =           3
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .3083318   .0089262    34.54   0.000     .2908369    .3258268
------------------------------------------------------------------------------
```


© 2020 AESS Publications. All Rights Reserved.

```
. margins, predict (outcome (1)) at (q26a=3) atmeans

Adjusted predictions                              Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==1), predict(outcome (1))
at           : q26a            =           3
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .1482143   .0068463    21.65   0.000     .1347959    .1616328
------------------------------------------------------------------------------

. margins, predict (outcome (2)) at (q26a=3) atmeans

Adjusted predictions                              Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==2), predict(outcome (2))
at           : q26a            =           3
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .5718714   .0072117    79.30   0.000     .5577368     .586006
------------------------------------------------------------------------------

. margins, predict (outcome (3)) at (q26a=3) atmeans

Adjusted predictions                              Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==3), predict(outcome (3))
at           : q26a            =           3
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .2799143   .0100415    27.88   0.000     .2602333    .2995952
------------------------------------------------------------------------------
```


© 2020 AESS Publications. All Rights Reserved.

```
. margins, predict (outcome (1)) at (q26g=3) atmeans

Adjusted predictions                            Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==1), predict(outcome (1))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =           3
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .1337177    .006481    20.63   0.000     .1210152    .1464201
------------------------------------------------------------------------------

. margins, predict (outcome (2)) at (q26g=3) atmeans

Adjusted predictions                            Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==2), predict(outcome (2))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =           3
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .5615964   .0076036    73.86   0.000     .5466936    .5764992
------------------------------------------------------------------------------
. margins, predict (outcome (3)) at (q26g=3) atmeans

Adjusted predictions                            Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==3), predict(outcome (3))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =           3
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .3046859   .0106952    28.49   0.000     .2837236    .3256482
------------------------------------------------------------------------------
```


© 2020 AESS Publications. All Rights Reserved.

```
. margins, predict (outcome (1)) at (q26e=3) atmeans

Adjusted predictions                              Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==1), predict(outcome (1))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =           3
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .1289492   .0082438    15.64   0.000     .1127915    .1451068
------------------------------------------------------------------------------

. margins, predict (outcome (2)) at (q26e=3) atmeans

Adjusted predictions                              Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==2), predict(outcome (2))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =           3
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .5574375   .0091377    61.00   0.000     .5395279    .5753471
------------------------------------------------------------------------------

. margins, predict (outcome (3)) at (q26e=3) atmeans

Adjusted predictions                              Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==3), predict(outcome (3))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =    1.961483 (mean)
               q26d            =    1.878376 (mean)
               q26e            =           3
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .3136133   .0148599    21.10   0.000     .2844884    .3427382
------------------------------------------------------------------------------
```


© 2020 AESS Publications. All Rights Reserved.

```
. margins, predict (outcome (1)) at (q26c=3) atmeans

Adjusted predictions                            Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==1), predict(outcome (1))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =           3
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |    .132605   .0073976    17.93   0.000      .118106     .147104
------------------------------------------------------------------------------
. margins, predict (outcome (2)) at (q26c=3) atmeans

Adjusted predictions                            Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==2), predict(outcome (2))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =           3
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .5606631   .0082294    68.13   0.000     .5445339    .5767924
------------------------------------------------------------------------------
. margins, predict (outcome (3)) at (q26c=3) atmeans

Adjusted predictions                            Number of obs   =       6257
Model VCE    : OIM

Expression   : Pr(q21==3), predict(outcome (3))
at           : q26a            =    2.120185 (mean)
               q26b            =    2.240531 (mean)
               q26c            =           3
               q26d            =    1.878376 (mean)
               q26e            =    1.754195 (mean)
               q26f            =    1.808055 (mean)
               q26g            =    2.098929 (mean)
               q26h            =    2.286879 (mean)
               q61             =    2.118268 (mean)

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _cons |   .3067319   .0126545    24.24   0.000     .2819296    .3315342
------------------------------------------------------------------------------
```


© 2020 AESS Publications. All Rights Reserved.

Section-4. Data Measurement

The descriptions of the indicators chosen for this study are as follows:

Variables	Indicators	Response categories
Tax compliance	Q21: Perception on firms not complying with taxes	1. Not wrong at all 2. Wrong but understandable 3. Wrong and punishable
Improved public goods and services	Q22e: Firms should not pay taxes until they get better services from the government	4. Disagree 5. Neither agree nor disagree 6. Agree
Perception on the use of other resources to finance government projects	Q23b: Government can find resources for development without taxing small firms	7. Disagree 8. Neither agree nor disagree Agree
Trust in government	Q29d: Trust of small firms in t government	1. No trust 2. A little trust 3. Somewhat trust 4. Trust alot
Tax knowledge	Q54a: Ease of finding out taxes and fees firms are liable for	1. Very difficult 2. Difficult 3. Easy 4. Very easy
Tax penalty	Q61: perception of the size of penalty for small firms, if caught not paying taxes	1. No penalty 2. Modest penalty 3. Heavy penalty
Improved telecommunication	Q26a: More taxes for better telecommunication	1. Not willing 2. Maybe willing 3. Definitely willing
Improved electricity	Q26b: More taxes for better electricity	1. Not willing 2. Maybe willing 3. Definitely willing
Improved public transport	Q26c: More taxes for better public transport	1. Not willing 2. Maybe willing 3. Definitely willing
Improved financial institutions	Q26d: More taxes for better financial institutions	1. Not willing 2. Maybe willing 3. Definitely willing
Improved law court	Q26e: More taxes for better law courts	1. Not willing 2. Maybe willing 3. Definitely willing
Improved labor regulation	Q26f: More taxes for better labor regulation	1. Not willing 2. Maybe willing 3. Definitely willing
Improved roads	Q26g: More taxes for better roads	0. Agree with statement 2 1. Agree with statement 1
Improved security	Q26h: More taxes for better security	1 The good of Nigerians 2 For its own good

Views and opinions expressed in this article are the views and opinions of the author(s), Asian Economic and Financial Review shall not be responsible or answerable for any loss, damage or liability etc. caused in relation to/arising out of the use of the content.

© 2020 AESS Publications. All Rights Reserved.