FACTORS AFFECTING TAX COMPLIANCE IN EASTERN DR CONGO: THE CASES OF RENTAL INCOME AND PROPERTY TAXES IN BUKAVU

By

Norbert AMINI KANAKUZE
Assistant à l'enseignement à l'Institut Supérieur des Techniques de Développement de Kalehe
Msc in Economics: Development Economics (UR-CBE, Kigali-Rwanda)

ABSTRACT

We collected from July to September 2020, in DPMER sub tax administration area Nyalukemba, Ndendere and Panzi located in Bukavu, South-Kivu Province, primary data, from 339 out of 391 property owners sampled. From collected data, a binary choice model was used to assess the relationship between tax compliance behaviour controlling for respondent's individual's characteristics and some economic and non-economic factors while an ordered logistic regression model helps us to assess the relationship between tax compliance levels and our independents variable of interest. Binary logistic model results revealed that Education level, tax knowledge, peers' effect and perceived equity and fairness are associated with property owners' compliance behaviour in Bukavu while the ordered logistic model findings outlined the association between tax compliance levels with tax knowledge, perceived equity and fairness and perceived provision of public goods and services by the Provincial Government.

Keywords: *Tax compliance, Rental income, Property tax, binary choice model, ordered logistic model.*

RÉSUMÉ

Nous avons collecté de juillet à septembre 2020, dans les ressorts de centres synthétiques de Nyalukemba, Ndendere et Panzi de la Direction Provinciale de Mobilisation et d'Encadrement des Recettes de la Province du Sud-Kivu à Bukavu, les données primaires de 339 sur 391 propriétaires fonciers de notre échantillon. Partant des données collectées, un modèle de choix binaire a été utilisé pour évaluer l'effet des caractéristiques individuelles des répondants ainsi que certains facteurs économiques et non économiques sur le comportement de conformité fiscale de ces derniers, tandis qu'un modèle de régression logistique ordonné nous a aidé à évaluer l'effet de nos variables indépendantes sur le niveau de conformité fiscale des propriétaires fonciers. Les résultats du modèle logistique binaire ont révélé que le niveau d'éducation, les connaissances fiscales, l'effet des pairs et la perception d'équité et de justice sont associés au comportement de conformité fiscale des propriétaires fonciers à Bukavu, tandis que les résultats du modèle logistique ordonné ont mis en évidence l'association entre les niveaux de conformité fiscale et les connaissances fiscales, la perception

d'équité et de justice ainsi que la perception de la fourniture des biens et services publics par le gouvernement provincial.

Mots-clés : *Conformité fiscale, Impôt sur le revenu locatif, Impôt foncier, modèle de choix binaire, modèle de régression logistique ordonné.*

1.   INTRODUCTION

1.1 Background

Taxation is the main source of revenue for both the developed and developing countries. As argued by Schumpeter DiJohn (2010) "taxes not only helped to create the state, they helped to form it".

Unfortunately, many African countries are not able to collect sufficient revenue to fund social programs for their citizen's and finance investment in strategic sectors that can be able to promote economic growth and ensure sustainable development, they instead rely on foreign.

With the 2006 Constitution, The Democratic Republic of Congo embarked upon decentralization reforms resulting in the share of the political, fiscal and administrative executive power between the Central and the Provincial levels.

Through fiscal decentralization perspective, in addition to the Central government transfers set by the Constitution at 40% of the taxes levied by the central level tax administrations, the Central Government transferred a certain number of taxes and user fees to Provincial Governments, in order to provide them revenues to fund their public service provision at local level.

Provinces were expected to capture benefits derived from the expansion of the residential buildings and housing market experienced during the last decade by raising more rental income and property tax.

For instance, in Kigali (Rwanda), land and property taxes are the largest untapped source of municipal revenues for many cities. It is estimated that a 1% tax on land and property in Kigali, for example, could generate over USD$60 million per year under full tax compliance (Collier *et al.*, 2018).

In support to fiscal decentralization implementation in DR Congo, from 2008 to 2016, the World Bank Group provided to some Provinces a technical and financial support through the Governance Capacity Enhancement Project. For the South Kivu Province, the project enables the foundation of the South Kivu Provincial Tax administration called DPMER, supported recruitment and training of tax collectors, and funded in 2012, 2015 and 2018 activities aimed to broaden property tax base.

More than 10 years after adoption of decentralization and despite the reforms undertaken, with nearly 5,772,000 people in the South-Kivu Province, provincial tax receipts from 2013 until 2018 has averaged around $6 million per year compared to targeted tax receipts averaged around $12 million% (South Kivu Province 2013 to 2018 accountability reports). This is a proof that there is no significant improvement of Provincial level public revenues and the tax collection rate of own-source revenues (OSRs) collected compared to tax revenues targeted.

Around 88% on average of Provincial government revenues during the same time frame came from the Central government transfers, as a matter of fact, Provincial governments remain more dependent to Central government transfers and are unable to plan effectively for their development.

These figures indicate that there is a real problem in own-source revenues mobilization in South Kivu and this low performance can be attributed mainly to low level of voluntary compliance a part from others issue such as poor administration and tax structure.

Therefore, understanding the compliance towards local tax payment is very important for the Provincial Government. This need is in line with the idea that tax payers' attitude towards tax payment is seen as a major precondition for effective revenue mobilization in all countries (Abdul–Razak and Adafula, 2013).

1.2 Statement of the Problem and hypothesis

Dealing with tax compliance is a priority for tax administrations, especially in developing countries armed with limited resources but faced with massive development targets (Bornman, Ramutumbu, and Pusheletso, 2019).

In south Kivu Province, from 2013 until 2018, the percentage of Provincial tax revenue achieved has reached respectively 76.7%, 60.4%, 43.8%, 47.3%, 51.7% and 41.7% of the targeted own-source revenues (South Kivu Province 2013 to 2018 accountability reports).

Additionally, own-source revenues achieved during 2013 until 2018 for the rental income and property taxes averaged respectively around 54% and 34.1% of related targeted revenues (South Kivu Province 2013 to 2018 accountability reports).

A property tax compliance experiment carried out in Kananga founds: "that nearly 90% of households almost all of which were visited by tax collectors still refused tax payment. Since less than 1% appear to have paid bribes instead of the tax, the vast majority of citizens are simply non-compliant" (BERGERON, TOUREK and WEIGEL, 2019).

Many empirical studies on factors affecting tax compliance have been conducted in Africa and some of them specifically on rental income tax and property tax studied separately in Kenya, Tanzania and Ethiopia.

They were oriented on the investigation of the effect of some economic and non-economic factors on the landlords or property owners' and rental income tax payers' compliance behavior.

In regard with DR Congo context, despite the relevance of that concern, at Central and Provincial level as well, not much is known about the determinants of tax payer's attitude toward the decision to pay or not to pay taxes. We have only identified some tax compliance field experiments focused on the city of Kananga, in the Kasaï Central Province carried out in 2018.

For instance, weigel (2018) and Pablo Balan et al. (2018) focused their field experiment research on property tax campaign in Kananga.

However, no research on this phenomenon has been conducted in Eastern DR Congo while we know that there is a real need to assess what factors are relevant in determining tax payer's decision related to domestic revenues payment.

Therefore, our research was guiding by the following questions:
- Is there any association between property owners' individual characteristics and their compliance behaviour, compliance levels?
- What could be the predictors of property owners' compliance behaviour, compliance levels among all of our non-economic and economic factors of interest?

After reviewing both theoretical and empirical literature, we have proposed the following hypothesis to be tested:

H1: Property owners' individual characteristics are not associated with their compliance behaviour and compliance levels related to rental income and property taxes in Bukavu,

H2: Our non-economic and economic factors of interest do not affect property owners' compliance behaviour and compliance levels.

1.3 Research Objectives

The overall objective of this study is to establish which factors are correlated with rental income and property tax payer's compliance behaviour and compliance levels in Bukavu.

Specifically, the study assesses the association between tax compliance behaviour, tax compliance levels with property owners' individual characteristics and evaluates the effect of some non-economic and economic factors on property owners' compliance behaviour and compliance levels related to rental income and Property taxes payment in Bukavu/South Kivu.

2. TAX COMPLIANCE LITERATURE REVIEW

2.1 Theoretical literature

2.1.1 Concept of tax compliance

According to Brown and Mazur, tax compliance is multi-faceted measure and theoretically, it can be defined by considering three distinct types of compliance such as payment compliance, filling compliance, and reporting compliance (Jolodar, Ahmadi and Imankhan, 2019).

Tax compliance is the acting of taxpayers in accordance with the tax laws and proclamations of the country.

He indicated that it can be appropriate reporting of income or tax base, computing the tax liability in the correct manner, filing of returns and payment of the tax liability on time (Tilahun, 2019).

For Roth et al. tax compliance is considered as compliance with reporting requirements, meaning that, the taxpayer files all required tax returns at the proper time and that the returns accurately report tax liability in accordance with the internal revenue code, regulations and court decisions applicable at the time the return is filed (Devos, 2014).

The two definition of tax compliance provided above converge and are complementary in the way that they outline the relevance of tax payers' acting in accordance with the tax law regarding filing returns, reporting of tax base and the payment.

Tax Non-compliance however, according to Andreoni J.et al.is defined as failure of individuals to act according to their tax obligation. They mentioned that it can be not reporting the true tax bases, not filing and paying on time, and incorrect calculation of tax liability (Tilahun, 2019).

2.1.2 Tax compliance related theories

2.1.2.1 The deterrence economic model

According to Devos (2014), principles of economic deterrence model were first discovered from the work of Becker, the 1968 Nobel Prize in economics, who analyzed illegal behavior using an economic framework identified as the economics of crime and proposed a narrow argument which implied that deterrents such as the probability of detection and penalties and sanctions, were within the control of society.

Furthermore, Davos (2014) highlighted that from Becker work, Allingham and Sandmo derived a model based on a number of assumptions including taxpayers as utility maximisers who possessed actual knowledge of penalty and detection rates.

The Allingham and Sandmo model are given by the function: $D = f(I, p, f, t)$

Where "D" stands for declared income, "I" the income, "p" the probability of detection, "f "fines and "t" tax rate.

In this model, the taxpayer is assumed to have an income (I) and have to choose the amount to declare to the tax agency and this declared income (D) is subject to tax rate (t); and on the other hand, the income that is not declared is not subject to tax. But, the taxpayer will face a probability of detection (p) at which a fine (f) will be imposed upon him for non-compliance (Tilahun, 2019).

Alm argued that this economics-of-crime approach and its extensions assumes that an individual pays taxes only because of the economic consequences of the evasion gamble and because they fear detection and punishment. It is clear that compliance cannot be explained entirely by such purely economic considerations and level of enforcement (Marandu, Mbekomize and Ifezue, 2015).

That why, it has been stressed the need to integrate to the deterrence model noneconomic factors such as sociological and psychological factors in order to better understand tax payers' compliance.

2.1.2.2 The Fiscal and Social Psychology models

As indicated in the previous section, fiscal and social psychology models encompass economic, fiscal and social-psychology factors in analyzing tax payers' compliance.

Comparatively to the economic deterrence model where the tax payers were considered as utility maximisers, these theories consider individual attitude, believes and social norms as having an influence on tax payers' compliance behaviour.

The theory of reasoned action (TRA) and the theory of planned are the main theories of this family we are going to focus on in the framework of this literature review.

a) The theory of reasoned action (TRA)

This theory is attributed by tax compliance researchers to Ajzen and Fishbein work. This model indicated that taxpayers' behaviour is directly determined by their intentions that are a function of their attitude towards behaviour and perception of subjective norms. The attitude toward behaviour is a positive and negative judgement in regard to the behaviour where subjective norms is the social pressures put on the person to perform the behaviour (Devos, 2014).

Sheppard and Warshaw argued that according to the Theory of Reasoned Action, people are more likely to do a behaviour if they evaluate the suggested

behaviour as having positive results (attitude) and if they think their significant others want them to perform the behaviour (subjective norm). A high correlation of attitudes and subjective norms to behaviour has been confirmed in many studies (Marandu, Mbekomize and Ifezue, 2015).

b) The theory of planned behaviour (TPB)

The theory of planned behaviour is attributed to Ajzen work in 1985 and it is viewed as an extension of his previous work with Fishbein in 1975 on the theory of reasoned action we described above for the reason we are going to provide in the coming paragraphs.

From the TRA, Ajzen and Fishbein sustained that there is strong relationship between attitude and subjective norms towards behaviour. However, they recognize later that attitude and subjective norms do not always lead to behaviour.

Therefore, to improve on the predictive power of the Theory of Reasoned Action Ajzen added a new component "perceived behavioural control" to help account for behaviours that arise where an individual's control over the behaviour is incomplete (Marandu, Mbekomize and Ifezue, 2015).

A part from attitude, subjective norms and perceived behavioural control as the main component, TPB outlines the relevance of persons' intention to perform the behaviour on the behaviour performed.

On that point, Edward, E. at al. (2015) mentioned that the main hypothesis of the Theory of Planned Behaviour is that there is one immediate determinant of behaviour, namely the person's intention to perform or not perform it. This intention is itself, in turn, viewed as determined by three things: attitude, subjective norms and subjective control toward the specific behaviour.

2.2 Empirical literature on tax compliance related to rental income and property taxes

A study carried out on landlords in Nakuru (Kenya) revealed that the perception of landlords on rental income taxation and the taxman was negative and this highly influenced their non-compliance. The knowledge on the rental income tax policy remains low and the cost of compliance also played a key role in determining the level of compliance (Thananga, Wanyoike and Wagoki, 2013).

In Hawasa City administration and SNNPRS (Ethiopia), a research on rental income tax payers indicated that the significant factors affecting their compliance attitude with tax systems are: financial constraints, referent group influences, awareness of tax payers, perception on tax fairness, understatement of income, educational status, government incentives, trust in tax assessment and collection procedure and rental tax audit. Among these factors educational

status and trust in tax assessment and collection procedures were the most significant in the study (Geremew, 2017).

However, in Eldoret (Kenya) an investigation on the effect of tax system simplicity among the rental income earners revealed a positive and significant correlation between the tax simplicity and tax compliance among the rental income earners (Serem, Robert and Phillip, 2017).

Furthermore, it has been found in Tanzania that there is generally high level of non-compliance among property owners. And that perceptions of an unfair property tax system and high and unaffordable rates stand out as the main reasons for non-compliance. Moreover, the study stressed the fact that dissatisfaction with local service provision is also an important reason (Merima Ali, Odd-Helge Fjeldstad and Lucas Katera, 2017).

For the DR Congo context, we reviewed three tax compliance studies which used an experiment research design carried out in Kananga city, the head quarter of the Kasaï Province.

The first study assessed the effect of low-capacity city, inefficient methods of tax collection and liquidity constraints on tax compliance by varying subsidized access to formal land titles, methods of tax collection and property tax rates faced by households (BALÁN *et al.*, 2018).

Another investigate the effect of ability to pay and legitimacy of the Provincial Government influenced by identity of tax collector on tax payment (Weigel, 2018).

The last study investigate how tax compliance varies with the size of the tax burden when opportunities of evasion are high. The study estimates the elasticity of property tax compliance (BERGERON, TOUREK and WEIGEL, 2019).

From the reviewed empirical literature in Africa, we found that results on individual characteristics, non-economic and economic factors that could influence the tax payer's compliance behaviour and compliance levels were not consistent.

For the DR Congo context, however, we noted that low-capacity city, tax rate, inefficient of tax collection, liquidity constraints or ability to pay and legitimacy of the Provincial Government factors have been investigated as predictors of low level of compliance in the framework of an experiment research design.

Others factors like perception of provision of public goods by the Provincial Government, tax knowledge, perception of equity and fairness of the tax system, peer effect, probability of being audited, corruption of tax agents and tax payers' individual characteristics which potentially may be relevant on the

decision to pay or not to pay taxes owe to Provincial Government was not considered.

This fact justifies the need to conduct a new research in the DR Congo context accounting for the factors mentioned above. That why using a survey research design we are carrying out this study in order to assess the relationship between property owners' compliance behaviour related to rental income and property taxes and the factors outlined above in Bukavu city, the biggest city in Eastern DR Congo.

2.3 Conceptual framework

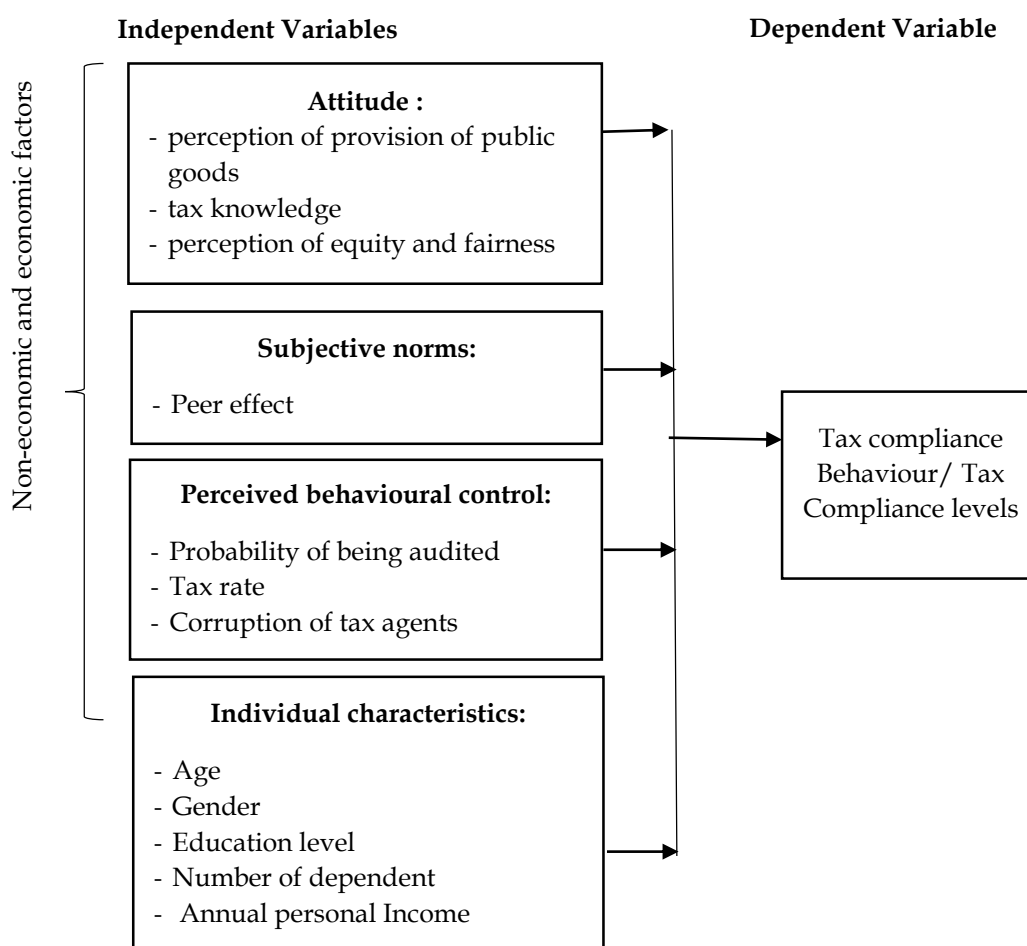In regard with the research objectives, our conceptual framework is given by the figure below:

Figure 1: Conceptual framework

Source: Adapted from the model suggested by (Razak and Bidin, 2019)

3. METHODOLOGY

3.1 Research design and research strategy

We adopted in this study a cross-sectional research design or a survey design. A cross-sectional research design entails the collection of data on more than one case and at a single point in time in order to collect a body of quantitative or quantifiable data in connection with two or more variables, which are then examined to detect patterns of association (Bryman, 2012).

Since this research sought to establish, which relevant factors, identified from tax compliance literature, are correlated with rental income and property tax payer's compliance behaviour in Bukavu context, a cross-sectional design helped us collect data at single point in time from property owners on all of our variables of interest assuming that we are more likely to encounter variation in the variables selected.

The quantitative approach has been used as our research strategy. It helped us gauging variation among property owners' and then examine relationship between their compliance behaviours, their compliance levels the dependent variables and our independent variables of interest.

3.2 Study population and identification

We sampled from a universe of the estimated number of 18,361 property owners' in Ibanda commune identified in Ndendere (9,042), Nyalukemba (4,620) and Panzi (4,699) provincial tax administration sub-office by Go Services, a private organization specialized in tax collection matters. We worked with property owners' in Ibanda Commune only, because comparatively to the two others Bukavu city commune, the rental income tax and the property tax base are higher in Ibanda due to the high rent level which leads to a higher rental income. For the property tax, buildings located in Ibanda are charged higher by the tax law than those located in Bagira and Kadutu.

For the reasons above, rental income tax and property tax revenues in Ibanda commune are assumed to contribute more on the Provincial Budget than in Bagira and Kadutu.

3.3 Sampling procedure

As we didn't dispose of the list of the 18,361 Property owners identified by Go Services, we used convenience sampling a non-probability sampling technique to select our property owners' sample members from Ibanda tax administration sub office (Ndendere, Nyalukemba and Panzi) ensuring that we have a proportional representation of each sub office on the basis of the number of property owners identified in each tax administration sub office involved in this study.

To determine our sample size we used the Yamane mathematical formula (Deyganto, 2018):

n = $\frac{N}{1+N.e^2}$, where N is the study population, n the sample size and e the error margin.

So, our sample size was given by: n = $\frac{18,361}{1+18,361 x 0.05^2}$=390.6 or 391 respondents.

3.4 Data collection and variables discussion

We collected Primary data using self-administered questionnaires in French. Our questionnaire was adopted from the one developed by Merima et al., (2014) coming from the afro barometer survey questionnaires. We are providing in the table below a summary of variables description, levels and measurements.

Table 1: Variables description, levels and measurements

Name		Level	Measurement
Dependent variable			
Tax compliance Behaviour	TCB	Dichotomous	1= Complaint or 0= otherwise
		Ordinal	1= Low, 2= Moderate and 3= High (compliance levels categories)
Independents variables			
Age	Age	Continuous	
Gender	Gender	Nominal	1=Male and 0=Female
Education Level	Edlevel	Ordinal	Ranging From 1 to 5
Number of dependents	Numdep	Continuous	
Annual personal Income	AnPinc	Continuous	
Tax rate height	Taxrath	Ordinal	Ranging From 1 to 4
Probability of being audited	Auditpro	Ordinal	Ranging From 1 to 4
Perception of Provision of Public Goods and Services	PGovPGS	Ordinal	Ranging From 1 to 4
Perception of tax agents corruption	PTagCor	Ordinal	Ranging From 1 to 4
Perception of tax system equity and fairness	PEqFair	Ordinal	Ranging From 1 to 4
Tax knowledge	TaxKnow	Ordinal	Ranging From 1 to 4
Peers effect	PeersEf	Ordinal	Ranging From 1 to 4

3.5 Methods of Data analysis

Using the software STATA 14, we analysed firstly data we collected by the mean of descriptive analysis. We determined property owners' gender and education level attained frequencies in the sample considering tax compliance behaviour and compliance levels and computed property owners' mean age, mean annual income and number of dependents mean value.

Secondly, since our dependent variable is binary on the first stage, we used a binary response econometric model known as logit regression model to perform econometric analysis.

Our general model is given by the equation below:

$$Probability(TCB = 1/X, W) = \underbrace{G(\beta_0 + \beta_1 X + \beta_2 W)}_{z} \, a \, non \, linear \, function \textbf{ (1)}$$

$Where \ G(\beta_0 + \beta_1 X + \beta_2 W)\epsilon\,]0,1[\ for \ all \ z\epsilon\mathbb{R}$

$G(z) = \dfrac{e^z}{1 + e^z} \ the \ logistic \ function$

In equation (1) TCB stands for tax compliance behavior a dummy variable taking a value of 1 for a compliant property owner and 0 for a non-compliant one. X is a vector of property owners' individual characteristics and W a vector of variables that capture different non-economic and economic factors affecting property owners' tax compliance behaviour. β_i are vector of respective coefficients.

The logit model helped us estimate the probability of our respondents to be compliant with the rental income tax and property tax controlling for individual characteristics, non-economic factors and economic factors.

The specific model to be estimated is given by the equation (2) below:

$Probability(TCB_i) = \beta_0 + \beta_1 Age + \beta_2 Gender + \beta_3 Edlevel + \beta_4 AnPinc + \beta_5 Numdep + \beta_6 Taxrat + \beta_7 Auditpro + \beta_8 PGovPGS + \beta_9 PTagCor + \beta_{10} PEqFair + \beta_{11} TaxKnow + \beta_{12} PeersEf$ (**2**)

Thirdly, we estimated an ordered logit model to investigate the association between our ordinal dependent variable having three categories associated to respondents' tax compliance levels controlling for the combination of our independent's variable: property owners' individual characteristics, economic and non-economic factors.

We posit that X_i are the set our independent variables, TCB standing for our observed tax compliance levels the dependent variable a function of TCB^* a continuous unmeasured latent variable and j our categories.

Our continuous latent variable TCB^* has threshold points or cut points noted in our case α_i. Therefore, the value of the observed variable TCB will depend on whether or not we have crossed a particular threshold.

As in this study j=3 meaning that we have 3 categories given by 1= low compliance level, 2= moderate compliance level and 3=high compliance level, then:

TCB_i = 1 if TCB_i^* is $\leq \alpha_1$

TCB_i = 2 if $\alpha_1 \leq TCB_i^* \leq \alpha_2$

TCB_i = 3 if $TCB_i^* \geq \alpha_2$

While TCB_i^* is given by the equation:

$TCB_i^* = \beta_0 + \beta_1 Age + \beta_2 Gender + \beta_3 Edlevel + \beta_4 AnPinc + \beta_5 Numdep + \beta_6 Taxrat + \beta_7 Auditpro + \beta_8 PGovPGS + \beta_9 PTagCor + \beta_{10} PEqFair + \beta_{11} TaxKnow + \beta_{12} PeersEf$ (2)

3.6 Operational definition of variables

3.6.1 Variables operational definition

We used subjective measure based on respondent's opinion to translate into observable and measurable elements our variables of interest so as to develop an index of the measure.

3.6.1.1 Dependent variable operational definition

Our dependent variable, tax compliance behaviour was operationalized in two stages:

Firstly, as a dummy variable taking the value 1 when the property owner is compliant or 0 otherwise, accounting for a challenge faced by researchers in tax compliance studies as evoked by Merima et al. (2014) resulting from the lack of reliable data due to individual's reluctance to reveal one's own non-compliance.

Similarly to the indirect question used by Merima et al., (2014) with a small adaptation, to measure property owners' compliance behaviour we asked them whether they think that is wrong for people not to pay taxes that they owe on their rental income and property. They picked one of the two answers: "Not wrong at all", "Wrong, but understandable" which is associated to someone with a non-complaint behaviour and "Wrong and Punishable" for people with a tax compliance behaviour.

In the second stage, our dependent variable was operationalized as a nominal variable measuring our respondents' compliance level taking the value 1 when the property owner is in low compliance level category, 2 for moderate compliance level category and 3 for the one in high compliance level

category. On the question if you were asked to do a self-evaluation of your degree of compliance with rental income and property taxes payment during the past five years in percentage, in which range would you belong to they picked one of the three answers: "49% and below" which is associated to someone in low level of compliance category, "50% to 69%" which is associated to someone in moderate level compliance category and "70% and above" for people in high level compliance category.

3.6.1.2 Independent variable operational definition

a) Attitude factors

- Property owners' satisfaction with provision of public services by the South Kivu Provincial governments was measured by the question: How well or badly the provincial government is handling maintaining local roads, local markets places and ensure people and their goods security in Bukavu city? They have chosen among the set of options below: (1) very badly, (2) fairly badly, (3) fairly well (4) very well.

- To capture property owners' tax knowledge related to rental income tax and property tax, we asked them choose among the provided assertion below the one who better indicate their knowledge level on rental income and property taxation law in DR Congo regarding who is supposed to pay, the tax calculation, the tax rate and when to pay: (1) Very low, (2) Low, (3) High (4) Very high.

- To capture property owners 'perception of equity and fairness we asked them to choose among the provided assertion below the one reflecting better their opinion on equity and fairness of rental income and property taxation in our country: (1) Too unfair, (2) Unfair (3) equitable and fair and (4) too equitable and fair.

b) Subjective norms factors

In order to capture peer effect which is simply the effect of others people behaviour on property owners' tax compliance behaviour, we asked them to give their opinion on the question: How often in South Kivu do people avoid paying the rental income tax and property tax the owe to the South Kivu provincial government: (1) Never (2) rarely (3) Often (4) Always.

c) Perceived Behavioural control factors

- Property owners' perception regarding the probability of being audited related to rental income and property taxation in Bukavu was measured by the question: Based on your experience, how easy or difficult is to avoid paying rental income and property taxes owe to the Provincial Government? With the following answers: (1) Very easy (2) easy (3) hard (4) very hard.

- To capture Property owners' perception about rental income and property tax rate height, we used the question: "what is your opinion about rental income and property tax rate height in Bukavu?" with the following answers: (1) too low (2) low (3) High (4) very high.

- To measure property owners' perception of tax agent's corruption' at Provincial level we asked them to answer to the question: "How many DPMER tax agents you think are involved in corruption", and asked to choose one answer that better express their perception of tax agent's corruption' level: (1) None (2) Some of them (3) Most of them (4) all of them.

4. DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 Descriptive analysis

4.1.1 Response rate

As illustrated in the table 2, we distributed questionnaires to 391 respondents and collected usable responses from 339 respondents putting the response rate at 86.7%.

Table 2: Sample size and response rates by tax administration sub office area

Tax administration sub office area	Property owners' population	Proportionate share in the sample	Returned questionnaires	Response rate
Ndendere	9,042	192	141	73.4%
Nyalukemba	4,620	98	95	96.9%
Panzi	4,699	100	103	103%
Total	18,361	391	339	86.7%

4.1.2 Respondents' profile

Table 3: Differences in individual's characteristics between compliant property owners and non-compliant ones

		Compliant property owners	Non-Compliant property owners
Gender	Male (%)	80.37	76.72
	Female (%)	19.63	23.28
Education level	Without formal Education (%)	-	2.16
	Primary certificate (%)	1.87	7.76
	Diploma (%)	27.10	37.5
	Undergraduate (%)	22.43	17.24
	License and above (%)	48.60	35.34
Age (Mean value)		46	46
Annual personal income in USD (Mean value)		4,538	3,674
Number of dependent (Mean value)		7	7

From Table 3 above, we found that the majority of the respondents with a compliant behaviour and those with non-compliant behaviour are Men, respectively 80.37% and 76.72% in the 2 cases.

Further, compliant respondents and non-compliant ones are in majority license degree holders and above, respectively 48.60% and 35.34%.

We found also that the mean age and the number of dependent mean value for the 2 categories of respondents are identical and respondents with a compliant behaviour are wealthier than those with non-compliant behaviour.

Table 4: Differences in property owners individual's characteristics accounting for their levels of compliance

		Low level of compliance	Medium level of compliance	High level of compliance
Gender	Male (%)	76.71	81.25	77.05
	Female (%)	23.29	18.75	22.95
Education level	Without formal Education (%)	0.68	0.78	3.28
	Primary certificate (%)	8.22	4.69	1.64
	Diploma (%)	41.10	32.03	22.95
	Undergraduate (%)	15.75	25	13.11
	License and above (%)	24.25	37.5	59.02
Age (Mean value)		46	48	43
Annual personal income in USD (Mean value)		3,243	3,979	5,342
Number of dependent (Mean value)		7	7	7

From the Table 4 we found that the majority of the respondents in the three categories are Men, 76.71 % with low level of compliance, 81.24% with moderate level of compliance and 77.05% with high level of compliance.

Further, respondents with a Diploma degree are those who represent the highest proportion of the first category, those with a license degree and above represent highest share in second category and the third category.

We found also that on average respondents with moderate level of compliance are older than those of the two remaining categories when those with high level of compliance are wealthier than other and all the three categories have an identical number of dependent mean value of 7.

4.1.3 *Descriptive statistics of factors affecting tax compliance behaviour*

4.1.3.1 *Tax compliance behaviour*

From our binary dependent variable operationalisation, we posit that respondents' who are going to answer to the question, what do you think about some property owners' action of not paying rental income and property taxes

they owe to the Provincial Government, by "Not wrong at all" and "Wrong, but understandable" will be associated to those with a non-complaint behaviour, coded by "0" and "Wrong and Punishable" for people with a tax compliance behaviour, coded by "1".

Table 5 below provides the frequencies of non-compliant and compliant property owners in the sample.

Table 5: Frequencies of non-compliant and compliant property owners

TCB1	Freq.	Percent	Cum.
0	232	68.44	68.44
1	107	31.56	100.00
Total	339	100.00	

This summary table indicates that 68.44% of our respondents were found to be non-compliant and 31.56% compliant.

4.1.4 Descriptive statistics of Tax Compliance levels

To operationalise the dependent variable tax compliance levels with three outcomes, we considered that respondents with "49% and below" was associated to someone in low level of compliance category coded "0", "50% to 69%" in medium level of compliance category coded "1" and "70% and above" high level of compliance category coded "2".

The Table 6 below provides for respondent's valid responses frequencies regarding the variable compliance levels.

Table 6: Respondents Frequencies regarding compliance levels

TC levels	Freq.	Percent	Cum.
0	146	43.58	43.58
1	128	38.21	81.79
2	61	18.21	100.00
Total	335	100.00	

This summary table indicates that 43.58% of our respondents were found to be in the low compliance level category while only 18.21% were found to belong to the high compliance level category.

4.2 Econometric analysis and discussion of results

4.2.1 Binary logistic regression model results

On the first stage of our econometric analysis, in line with our main objective and due to the specificity of our binary choice dependent variable we estimated a logistic regression model and obtained estimates displayed in table 7 below.

Table 7: Binary Logistic regression results

TCB1	Coef.	t-value	p-value
Age	.007	0.62	.537
Gender	.08	0.24	.812
Education level	.365	2.57	.01
Annual Personal income	0	1.25	.213
Number of dependent	.01	0.22	.828
Provision of Public Goods and Service	.032	0.17	.864
Tax Knowledge	.338	1.83	.067
Perceived Equity and Fairness	.526	2.47	.014
Peers Effect	.34	1.76	.078
Audit probability	.088	0.49	.625
Tax rate height	-.286	-1.38	.168
Perceived tax agent Corruption	-.049	-0.27	.787
Constant	-5.214	-3.51	0

Mean dependent var	0.313	SD dependent var	0.464
Pseudo r-squared	0.086	Number of obs	323.000
Chi-square	34.601	Prob > chi2	0.001
Akaike crit. (AIC)	392.720	Bayesian crit. (BIC)	441.829

Wald test for the logistic regression model

(1) [TCB1]Age = 0
(2) [TCB1]Gender = 0
(3) [TCB1]Edlevel = 0
(4) [TCB1]AnPinc = 0
(5) [TCB1]NumDepen = 0
(6) [TCB1]PGovPGS = 0
(7) [TCB1]TaxKnow = 0
(8) [TCB1]PEqFair = 0
(9) [TCB1]PeersEf = 0
(10) [TCB1]Auditpro = 0
(11) [TCB1]Taxrath = 0
(12) [TCB1]PtagCor = 0

    chi2(12) =   29.91
   Prob > chi2 =   0.0029

The Wald test result above is consistent with LR test result displayed in table 7, indicating that Prob >chi2 =0.001 the probability of getting a LR test statistic as more so, than the observed under the null hypothesis is less than 0.05.

This is a statistical evidence for the presence of good relationship between the tax compliance behaviour and combination of our independent variables of interest. Thus, the null hypothesis stating there is no difference between the model without independent variables and the model with independent variables is rejected.

Out of twelve independent variables, four were found to be significant in explaining property owners' compliance behaviour regarding rental income and property tax payment in Bukavu. Among all individual characteristics, only education level attained was found to be associated with property owners' compliance behaviour.

Concerning non-economic and economic factors, we found that tax knowledge, perceived equity and fairness of the rental income and property taxes system and peers' effect were associated with property owners' compliance behaviour.

Education level was found to be significant at 5%, Tax knowledge at 10%, Perceived equity and fairness of the rental income and property taxes system at 5% and Peers effect at 10%.

Results in table 8 below show the binary logistic regression with marginal effect.

Table 8: Binary Logistic regression with marginal effects

Average marginal effects   Number of obs   =   323
Model VCE   : OIM
Expression   : Pr (TCB1), predict()
dy/dx w.r.t. : Age Gender Edlevel AnPinc NumDepen PGovPGS TaxKnow PEqFair PeersEf Auditpro Taxrath PtagCor

	dy/dx	z	P>z
Age	0.001	0.620	0.537
Gender	0.015	0.240	0.812
Education level	0.070	2.670	0.008
Annual Personal income	0.000	1.260	0.209
Number of dependent	0.002	0.220	0.828
Provision of Public Goods and Service	0.006	0.170	0.864
Tax Knowledge	0.065	1.860	0.063
Perceived Equity and Fairness	0.101	2.550	0.011
Peers Effect	0.065	1.790	0.073
Audit probability	0.017	0.490	0.624

Tax rate height	-0.055	-1.390	0.163
Perceived tax agent Corruption	-0.009	-0.270	0.787

4.2.2 Binary logistic regression model results interpretation and discussion

a. Education level

As illustrated in table in table 7, Education level was found to have at 5% a significant positive effect on property owners' tax compliance behaviour in Bukavu. From the average marginal effect displayed in table 8, we can say that keeping all other factors constant, if education level increases by one unit, the probability of a property owner to be compliant will increase by 0.07.

This simply means that more years of education increase property owners' probability of being compliant with rental income and property taxes payment.

This finding is in line with (Ali, Fjeldstad and Sjursen, 2014) study; they found in Tanzania that more years of schooling significantly increase the probability of having a tax compliance attitude.

In South Gondar Zone in Ethiopia (Haile Ademe and Destaw Simret, 2020) found also that education was an important significant determinant of tax compliance behaviour except for tax payer's without formal education.

b. Tax knowledge

From table 7, rental income and property taxes knowledge was found to have at 10% a significant positive effect on property owners' tax compliance behaviour in Bukavu.

Keeping all other factors constant, if tax knowledge rises by one unit, the average marginal effect displayed in table 8 for the variable tax knowledge illustrates that the probability of a property owner to be compliant will increase by 0.065.

An increase of property owners' awareness or knowledge regarding rental income and property taxes law rises their probability of being compliant.

This result is consistent with (Thananga, Wanyoike and Wagoki, 2013) research, they found that in Nakuru municipality (Kenya) landlord's tax knowledge on rental income policy has a positive influence on their compliance. (Geremew, 2017) study also found that there is positive relationship between tax payer's awareness on rental tax and compliance in Hawasa city (Ethiopia). (Oladipupo and Obazee, 2016) found the same results for small and medium scale enterprises in Nigeria.

c. *Perceived equity and fairness of the rental income and property taxes system*

As illustrated in table in table 7, Perceived equity and fairness of the rental income and property taxes system was found to have at 5 % a significant positive effect on property owners' tax compliance behaviour in Bukavu. From the average marginal effect displayed in table 8, we can say that keeping all other factors constant, if the perception of equity and fairness of the rental income and property taxes system rises by one unit, the probability of a property owner to be compliant will increase by 0.101.

Property owners' who have the perception that rental income and property taxes system are equitable and fare are more likely to be compliant.

This finding is in line with (Tehulu and Dinberu, 2014) research who found that perceived equity and fairness has a positive significant effect on tax payers' compliance behaviour in Bahir Dar city (Ethiopia). (Haile Ademe and Destaw Simret, 2020) also found the same result in South Gondar Zone.

(Ya'u and Saad, 2019) research revealed in Jigawa State in Nigeria positive and significant relationship between tax payer's perception of fairness and voluntary tax compliance.

d. *Peers effect*

From table 7, peers' effect was found to have at 10% a significant positive effect on property owners' tax compliance behaviour in Bukavu. Keeping all other factors constant, if the effect of this variable rises by one unit, the average marginal effect displayed in table 8 for the variable peer's effect illustrates that, the probability of a property owner to be compliant will increase by 0.065.

Peers effect relationship with tax payers' compliance behaviour in study shows inconsistent results with others studies regarding the direction of the relationship.

(Geremew, 2017) for instance found a negative significant effect of referent groups on rental income tax payer's compliance behaviour in Hawasa city (Ethiopia).

However, (Ali, Fjeldstad and Sjursen, 2014), found that the perception of people's compliance is likely to significantly increase own tax compliance in Tanzania which is consistent with our finding. The positive relationship found may be interpreted as follows, the more a property owner perceive that peers are compliant, the more he is likely to be compliant.

4.2.3 *Ordered logit regression results*

On the second stage of our analysis we estimated an ordered logistic model due to the specificity of our dependent variable who has three ordered

outcomes: low, medium and high compliance levels. We obtained results displayed in table 9 below.

The Wald test result below is consistent with LR test result displayed below table 9, indicating that Prob >chi2 =0.000 the probability of getting a LR test statistic as more so, than the observed under the null hypothesis is less than 0.05.

This is a statistical evidence for the presence of good relationship between the tax compliance levels and combination of our independent variables of interest. Thus, the null hypothesis stating there is no difference between the model without independent variables and the model with independent variables is rejected.

Out of twelve independent variables, three were found to be significant in explaining property owners' compliance levels regarding rental income and property tax payment in Bukavu.

Among all individual characteristics, no one was found to be significant. Concerning non-economic and economic factors, we found that perception of provision of public goods and service by South Kivu Provincial Government, tax knowledge and perceived equity and fairness of the rental income and property taxes system were associated with tax compliance levels.

Table 9: Ordered logistic regression Estimates

TClevels	Coef.	t-value	p-value
Age	-.003	-0.30	.765
Gender	.215	0.74	.462
Education level	.113	0.92	.356
Annual Personal income	0	3.83	0
Number of dependent	-.028	-0.67	.506
Provision of Public Goods and Service	.298	1.76	.078
Tax Knowledge	.727	4.39	0
Perceived Equity and Fairness	.801	3.98	0
Peers Effect	-.068	-0.40	.688
Audit probability	.046	0.29	.773
Tax rate height	.055	0.30	.763
Perceived tax agent Corruption	.026	0.17	.869
Constant	4.656	.b	.b
Constant	6.805	.b	.b
Mean dependent var	0.756	SD dependent var	0.745
Pseudo r-squared	0.122	Number of obs	320.000
Chi-square	81.065	Prob > chi2	0.000
Akaike crit. (AIC)	614.007	Bayesian crit. (BIC)	666.763

Wald test for the ordered logistic regression model

(1) [TClevels]Age = 0
(2) [TClevels]Gender = 0
(3) [TClevels]Edlevel = 0
(4) [TClevels]AnPinc = 0
(5) [TClevels]NumDepen = 0
(6) [TClevels]PGovPGS = 0
(7) [TClevels]TaxKnow = 0
(8) [TClevels]PEqFair = 0
(9) [TClevels]PeersEf = 0
(10) [TClevels]Auditpro = 0
(11) [TClevels]Taxrath = 0
(12) [TClevels]PtagCor = 0

    chi2(12) =   54.28
  Prob > chi2 =   0.0000

4.2.4 Ordered logit regression results interpretation and discussion

a. Perception of Provision of public goods and services by the Provincial Government

As illustrated in table in table 9, this variable was found to have at 10% a significant positive effect on property owners' variable response tax compliance levels in Bukavu.

If a property owner Perception of Provision of public goods and services by the Provincial Government increases by one unit, his ordered log-odds of being in the high compliance level category would increase by 0.298 while others variables in the model are held constant.

Property owners' who are more satisfied with the provision of public goods and services by the Provincial Government are more likely to be in the high compliance level category.

This finding is in line (Ali, Fjeldstad and Sjursen, 2014) study. Using a logit model and ordered logit model for robustness check, they found that people who are more satisfied with public service provision in Uganda, Tanzania, Kenya and South Africa were more likely to have a tax compliant attitude.

b. Tax knowledge

From table 9, rental income and property taxes knowledge was found to have at 1% a significant positive effect on property owners' variable response tax compliance levels in Bukavu.

If a property owner rental income and property taxes knowledge increase by one unit, his ordered log-odds of being in the high compliance level category would increase by 0.727 while others variables in the model are held constant.

Property owners with a high level of knowledge about rental income and property taxes law are more likely to be in the high compliance level category.

This result is consistent with (Sebhat and Assfaw, 2019) research. Using an ordered logit model, they found that tax knowledge and awareness have a positive and significant effect on tax payers' compliance behaviour.

c. *Perceived equity and fairness of the rental income and property taxes system*

As illustrated in table in table 9, Perceived equity and fairness of the rental income and property taxes system was found to have at 1% a significant positive effect on property owners' variable response tax compliance levels in Bukavu.

If a property owner Perception equity and fairness of the rental income and property taxes system increases by one unit, his ordered log-odds of being in the high compliance level category would increase by 0.801 while others variables in the model are held constant.

Property owners' who have the perception that rental income and property taxes system are equitable and fare are more likely to be in the high compliance level category.

This finding is in line with (Gadi, 2015) research, using a multinomial logit model he found that in Rwanda, equity and fairness of the tax system affect tax compliance levels of formal sector tax payers.

5. SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Summary of Findings

The overall objective of this study was to establish which factors are correlated with rental income and property tax payer's compliance behaviour and compliance levels in Bukavu, the South Kivu Province Head Quarter located in Eastern DR Congo.

Based on an attitude survey conducted on 339 respondents in Ndendere, Nyalukemba and Panzi sub tax administration areas and using logistic regression model for tax compliance behaviour and ordered logistic regression model for tax compliance levels, we tested the hypotheses below:

H1: Property owners' individual characteristics are not associated with their compliance behaviour and compliance levels related to rental income and property taxes in Bukavu,

H2: Our non-economic and economic factors of interest do not affect property owners' compliance behaviour and compliance levels.

For the logistic regression model, among all individual characteristics, the findings indicated that only Education level, at 5% of significance, had positive effect on property owners' tax compliance behaviour in Bukavu and therefore was associated with their compliance behaviour.

With regard to non-economic and economic factors, the findings indicated that, tax knowledge at 10% of significance, perceived equity and fairness of the rental income and property taxes system at 5% of significance and Peers effect at 10% of significance had positive effect on property owners' tax compliance behaviour and in fact was associated with their compliance behaviour regarding rental income and property tax payment in Bukavu.

These findings provide us evidences that the research hypotheses we formulated was not supported.

For the ordered logistic regression model, the findings indicated that any of our individual characteristics of interest was associated with property owners' compliance levels in Bukavu.

Concerning non-economic and economic factors, the findings revealed that, Perception of Provision of public goods and services by the Provincial Government at 10% of significance, tax knowledge at 1% of significance and perceived equity and fairness of the rental income and property taxes system at 1% of significance had positive effect on property owners' tax compliance behaviour and in fact was associated with their compliance levels regarding rental income and property tax payment in Bukavu.

These results provide us evidences that the research hypothesis 1 formulated was not supported while the hypothesis 2 was supported.

5.2 Conclusion and Policy Implications

South Kivu Provincial Government is facing challenges of development and therefore need to increase his own-source revenue collection, especially from rental income and property taxes.

Considered as one of the factors explaining low level of own-source revenue mobilization, tax compliance behaviour constituted our focus in order to provide our contribution to South Kivu Province policy and decision maker's tracks to be explored when formulating tax policies aiming at increase own-source revenue collection.

The research has attempted to discover the association that could exist between tax payers' compliance behaviour and compliance levels controlling for some relevant factors that have not been investigated in the research area context.

The study findings have shown the relevance of Education level, tax knowledge, perceived equity and fairness of the rental income and property taxes system and peers' effect in determining property owners tax compliance behaviour in Bukavu.

Moreover, the study revealed that tax knowledge, Perception of Provision of public goods and services by the Provincial Government and perceived equity and fairness of the rental income and property taxes system are associated with property owner's tax compliance levels in the research area.

Therefore, the correlation pointed out from these findings may lead to a certain number of tax policy implications despite the fact that the study didn't investigate causality between our variable of interest:

- There might be a real need to increase tax payer's knowledge on tax laws at Provincial level.

   The South Kivu Provincial Government, through its Ministry of finance should provide its support to the Provincial tax administration by mobilizing fund that can be invested in activities aiming to increase tax payer's awareness on own-source revenue laws. This might influence positively voluntary compliance with rental income and property taxes in South Kivu;

- There should be also a need to build trust between the tax payers and the South Kivu Provincial Governments by increasing accountability and public service provision.

Additionally, fairness and equity of the rental and property tax system issues should be considered when formulating tax policies aiming to broaden tax base and increase voluntary compliance.

5.3 Areas for further studies

We consider this tax compliance study in Bukavu as an exploratory one due to the relevance of the phenomenon studied. There is a real need to deeply understand the determinant of tax compliance in Eastern DR Congo by carrying out other studies.

In line with this, it may be interesting for future researchers to extend this study to the whole South Kivu Province, combining administrative data with attitude survey data using a mixed method research strategy in order to try to establish causality between our variables of interest.

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