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Determinants of business tax compliance: A case study of Togo

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The results of a survey conducted by the Office of Togolese Revenue (OTR) in 2019, which covered 413 formal firms, show that several factors are key determinants of businesses' willingness to pay taxes. These include appreciation of tax fraud, amendment of tax laws, tax knowledge, tax beneficiaries, bribes, severity of penalties, legitimacy of customs duties, appreciation of tax amount, tax burden, legitimacy of Value Added Tax (VAT) and geographical location (Maritime, Plateaux, Centrale, Kara and Savane) of the firms. Using a probit model, the results show that all these factors are key determinants of voluntary tax compliance, except for the tax laws amendment, tax amount appreciation and the tax burden. When isolating the Maritime region, the result remains unchanged except for the fact that the appreciation of tax fraud has no significant impact on voluntary compliance in that region. Finally, the determinants vary once businesses are differentiated by size (Small, Medium and Large) nationally or regionally.

Key words : Tax evasion, tax compliance, Togo, tax consent, firms.

INTRODUCTION

Paying taxes is essential in order to participate in the budget necessary to make a country function. Through taxes, the government is able to educate, care for and defend the population, build roads, support businesses, and help the poor. Although it is unanimously accepted that to run affairs of the State, it is obligatory for the people and businesses to pay taxes, unfortunately this is not enough of a convincing argument for all agents. As a result, some taxpayers' perceptions and attitudes can reflect a lack of consent to pay taxes (tax avoidance) or illustrate fraudulent practices (tax evasion); this is the so called tax non-compliance.

Tax compliance is defined as the willingness of individuals and taxable entities to act in accordance with the tax laws and administration in letter and spirit without the requirement to use coercive actions (James and Alley, 2002). It is the commitment or the attitude of taxpayers (citizens or businesses) in respecting their

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declarative and payment obligations by filing their declarations on time and paying their due taxes. However, in the event of non-compliance, there are negative consequences on tax collection, resulting in a significant loss of tax resources that are intended to be used to fund the country's public spending.

In Togo, the mobilisation of tax revenue is at the forefront of the agenda of the State in pursuit of sustainable development. To achieve this, they have embarked on wide-ranging tax reforms with a cross-departmental entity called the Office of Togolese Revenue (OTR) by combining customs and tax administration. The reforms are intended to increase tax revenues significantly, to give the public authorities the necessary funds to operate and the capacity to fully assume their regalian functions. However, we observe that Togo is characterised by a fiscal paradox of relatively high tax rates but with very low tax returns. Hence, the challenges remain significant, which require considerable efforts both from tax authorities and citizens.

In this respect, tax authorities have been continuously introducing measures to support the national economy and to encourage investment. For example, in 2021, entrepreneurs and businesses benefited from tax relief measures. Moreover, the tax authorities have embarked on a process of bringing the tax administration closer to the taxpayers through holding awareness campaigns ('tax citizens days'). This approach consists of making taxpayers understand the necessity and importance of respecting their tax obligations by complying with their tax reporting and payment obligations. But, by all this initiatives, there are still some serious questions that need to be asked whether awareness campaigns raise taxes or tax relief initiatives that are sufficient enough to prevent non-compliance with tax obligations ?

In our view, to better tackle tax avoidance, it is necessary to identify the underlying factors mentioned above. So, this study aims to identify the important determinants that influence Togolese corporate taxpayers to meet their tax obligations. The originality of this paper stems from the use of reliable data obtained directly from the Togolese Tax Office. In addition, the survey includes 413 companies of different sizes (small, medium and large) spread throughout the country, and covering different geographical locations including the five administrative regions (*Maritime, Plateaux, Centrale, Kara and savane*) (Appendix Table 1).

In Togo, tax revenues have increased significantly over the last ten years (Appendix Figure 7), due to increases in different types of taxes, in particular VAT and customs duties, as shown in Figure 1. It shows that VAT, customs duties, corporate income tax (CIT) and personal income tax (PIT) represent on average 40%, 20%, 12% and 7% of total tax revenues respectively.

Our results are consistent with those in the literature and can be summarized as follows: Geographical location, tax evasion assessment, bribes, tax knowledge, tax beneficiaries, the severity of penalties, and the cost of legitimate customs duties have a significant positive relationship with voluntary tax compliance. On the other hand, factors such as the size of the company and the legitimacy of VAT have a disincentive effect on voluntary tax compliance. Furthermore, no significant relationship was found between factors such as the tax burden, the amendment of the tax laws, and the tax paid. Our findings suggest that the determinants of voluntary tax compliance vary depending on the size of the business and the region. Factors such as bribes, severity of penalties, legitimacy of customs duties, tax knowledge, and tax beneficiaries encourage businesses to comply voluntarily with paying taxes. On the other hand, the size of business and the legitimacy of VAT lead to tax evasion. Furthermore, our results indicate that the determinants of voluntary tax compliance differ between the Maritime region and the rest of the sample. The paper is organized as follows: Section 2 relates our work to the existing literature. Section 3 presents a brief description of data, the conceptual framework, and empirical methodology. Section 4 presents and discusses the various findings from baseline models and robustness checks. Finally, Section 5 concludes, presents policy implications and possible directions for future research.

RELATED LITERATURE

A part of the existing literature on tax revenue collection has often been focused on the different reasons why some taxpayers evade paying taxes. At the outset, some studies divide tax compliance into different approaches in order to better understand the factors that affect the behaviour tax compliance. For instance McBarnet (2003) distinguish four types of compliance. The first type is called *committed compliance* which assumes that taxpayers will obey tax laws without any complaint. The second type, the so-called *capitulative compliance* which occurs at the stage of tax reporting where taxpayers report their taxes in inappropriate ways, for example by cutting expenses or making cash savings in the operation of their business. The third one, *non compliance* where taxpayers rely on tax experts to help them in interpreting the tax laws, allowing them to manipulate their taxes. Finally, *creative compliance* refers to the case where taxpayers will find weaknesses in tax laws by redefining them for their profits and recalculating their costs when they file their taxes. Likewise, we also distinguish two other types of compliance, namely *administration* and *accuracy* of tax returns, which are highlighted in Chow (2004), where taxpayers are free when filing their tax returns, and that determines their ability to file their tax returns well in time each year and to pay the tax accurately.

Several studies have provided a theoretical framework to explain the factors that influence individual compliance

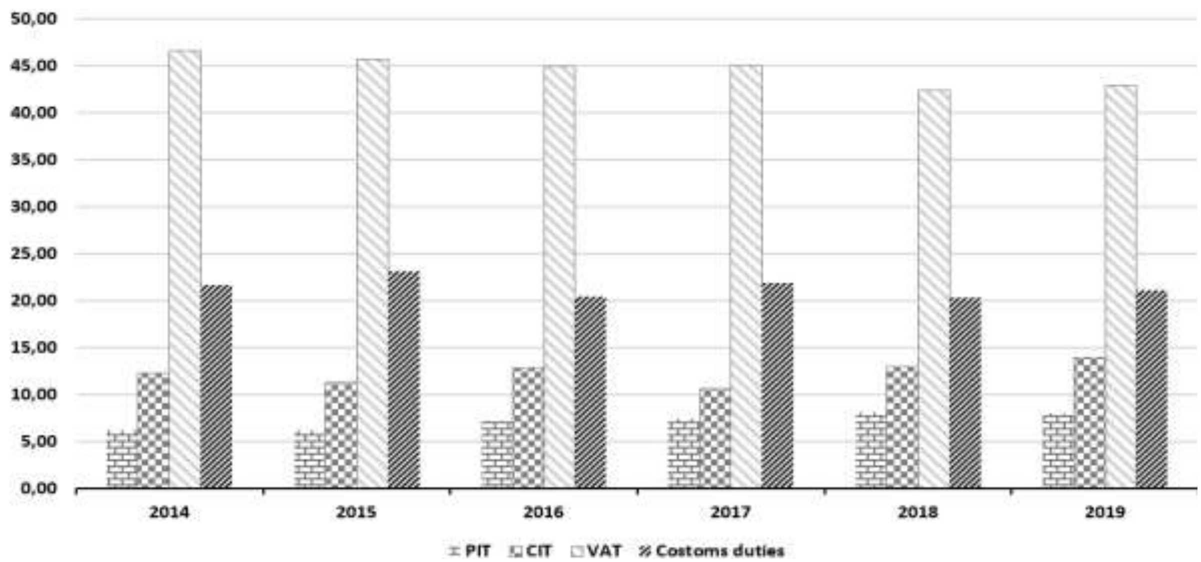


Figure 1. Composition of Tax Revenues in Togo (2014-2019).
Source: Authors based on OTR data.

(Fischer et al., 1992; Cuccia, 1994; Devos, 2014). These theoretical models explain different aspects. Firstly, there is a human aspect which considers that individuals interact with each others in accordance with the social norms prevailing in a society which do not permit them to maximize their utility. Nevertheless, factors related to human behaviour in terms of beliefs, attitudes, and norms are concern of the concept of the behaviour compliance. Other aspects include sociological factors like age and gender, education, level of income, sources of income and employment. Similarly, aspects related to tax complexity, sanctions, the fear of being detected, tax burden, and the moral level of taxpayers are also considered to measure the possibilities of non-compliance.

Moreover, some of the literature also review the tax compliance focusing on empirical evidence by exploring different empirical findings based on geographical areas under study or the estimation methods/techniques used. For instance, authors such as Torgler (2011), Torgler and Schneider (2007), Heinemann (2011), Torgler et al. (2008), Hug and Sp¨orri (2011), Marien and Hooghe (2011) and Frey and Torgler (2007), have established a positive link between individual taxpayers' tax compliance and number of factors like trust in government, legal system, trust in democracy, the military and police, religion and institutional quality. On the contrary, moral conservatism and ethnic fragmentations are factors that reduce the incentives for tax compliance of individual taxpayers according to Marien and Hooghe (2011) and Lago-Pen˜as and Lago-Pen˜as (2010). Furthermore, Bobek et al. (2013) have shown that social norms also have an important influence on the behaviour of tax compliance both directly and indirectly. More precisely, their analysis show that the ethical beliefs of individuals (personal norms) and the expectations of relatives (subjective norms) directly influence tax compliance decisions, while the general expectations of society (injunctive norms) and the actual behaviour of other individuals (descriptive norms) exert an indirect influence.

International literature that focuses more on corporate tax compliance rather than individual agents, also includes a multitude of factors that influence tax compliance, although results vary between researchers. Certain researchers have classified taxpayers' compliance behaviour according to firm characteristics such as, size, nationality of manager, sector and type of firms. For example, Hanlon et al. (2005) observe that small-sized firms are described as more noncompliant than that of medium but the medium-sized firms are more tax compliant than the large firms. Likewise, domestic firms are more compliant than foreign-owned firms. And, state-owned firms are supposed to be more compliant than private firms, while non-multinational firms tend to be more compliant than multinational ones. In contrast, Alm and McClellan (2012) argue that domestic firms evade taxes more and declare less than foreign and state-owned firms. In parallel, other studies have examined the impact of taxpayer knowledge and sanctions on corporate tax compliance such as Oladipupo and Obazee (2016) ; according to them tax knowledge has a positive impact on tax compliance, but the tax penalty has no significant effect on tax compliance. Whereas Virmani (1989) predicts that avoidance may increase with higher penalties, assuming that firms respond to harsher penalties by lowering production to reduce the probability of detection, which may offset the higher cost of avoidance due to the higher penalty rates, and thus lead to greater avoidance.

Our study also overlaps with the part of the literature that addreses taxpayers' compliance behaviour in relation to other factors such as age, equity and industry, as well as their attitudes toward tax rate structure, tax complexity, tax enforcement, equity of the legislation and perception of corruption. Factors such as the legitimacy of the state, the efficiency of the tax administration, the legitimacy of the tax authorities, the feeling of belonging to the nation or national pride and the perception of the risk of sanctions and their severity, have also been prominent in tax compliance literature (Abd Obaid et al., 2020; Radulovic, 2019; Mickiewicz et al., 2019; Everest-Phillips and Sandall, 2008). For example, disapproval of tax administration, the risk of being caught and the overall tolerance of tax evasion are negatively associated with corporate tax compliance (Radulovic, 2019). Among those interested in the tax compliance of Small and Medium Enterprises (SMEs), Yucedogru (2013) finds that the perception of the administration and religious beliefs have a significant impact, while patriotism and tax complexity have no real influence on their tax compliance. Additionally, the OECD guidance on the risk of corporate tax evasion shows that SMEs sometimes choose to move into the informal sector to evade taxes.

DATA AND EMPIRICAL METHODOLOGY

Empirical data on tax compliance in Togo

This paper carries out an empirical investigation of the determinants of business tax compliance in Togo. For this purpose, data from a survey was used on voluntary tax consent from the Office of Togolese Revenue (OTR) carried in 2019 covering 413 formal firms. The survey includes only formal firms (firms registered at the Chamber of Commerce of Togo, at the business creation center and having a tax certificate, that is firms declared to the OTR) because they are obliged to declare and pay their taxes.

Figure 2a shows that the sample of 413 firms is composed of 56.9%, 20.58%, and 22.52% of small, medium and large businesses respectively. Figure 2b shows that 60% of businesses of all sizes are complying with tax liabilities, while 40% are trying to avoid paying their taxes. This compliance is distributed according to business size and geographic location.

As can be seen from Figure 2c, small businesses have the highest percentage of tax compliance that is 79.2%. The direct implication of this statement is that in Togo, it is not small businesses that are the biggest tax evaders. In comparison, 42% of medium and large businesses show non-compliance. According to the geographical location (see Figure 2d), the *Centrale* and *Plateaux* regions have the highest level of tax compliance among the five economic regions. The businesses surveyed in these regions are all compliant. In the *Savanes* region, 83.33% of businesses are compliant against 16.67% that are not. The *Kara* region shows that 66.67% of firms are compliant, while in the *Maritime* region, 64.88% of businesses are compliant with tax laws whereas 35.12 % are not compliant. In the *Savanes* region, the percentage of firms complying with tax obligations is 83%.

Figure is made from Tax Compliance 1, which includes companies that say they do notwant to use Loopholes in the tax law and do not want to "negotiate" with tax collectors to pay less tax.

However, these statistics should be taken with caution as the number of businesses surveyed in the other regions is very low compared to the *Maritime* region. The point we are making is that, based on the answers provided in the questionnaire, all firms surveyed in Centrale and Plateaux are classified as compliant, regardless of their total number.

Data set and explanatory variables

The data comes from a nationally representative probability survey of firms, based on the latest results of the general firms survey conducted in 2017. The survey method used was a stratified simple random survey, with the "firm" as the unit of study and stratification variable being the size of the firm, which had three modalities: small, medium and large. Results from the survey showed that more than nine out of ten formal firms were localised in the Maritime region. The number of units n_h (where h represents the stratum) to be selected in each stratum is obtained by applying a proportional allocation to improve the precision of the estimates. To facilitate post-survey processing, a minimum size of thirty units (which empirically is the size required to have precision estimates) will be imposed to be selected in each stratum. Hence our sample size is as follows :

$$n = t^2 . \frac{\sigma}{\varepsilon^2}$$

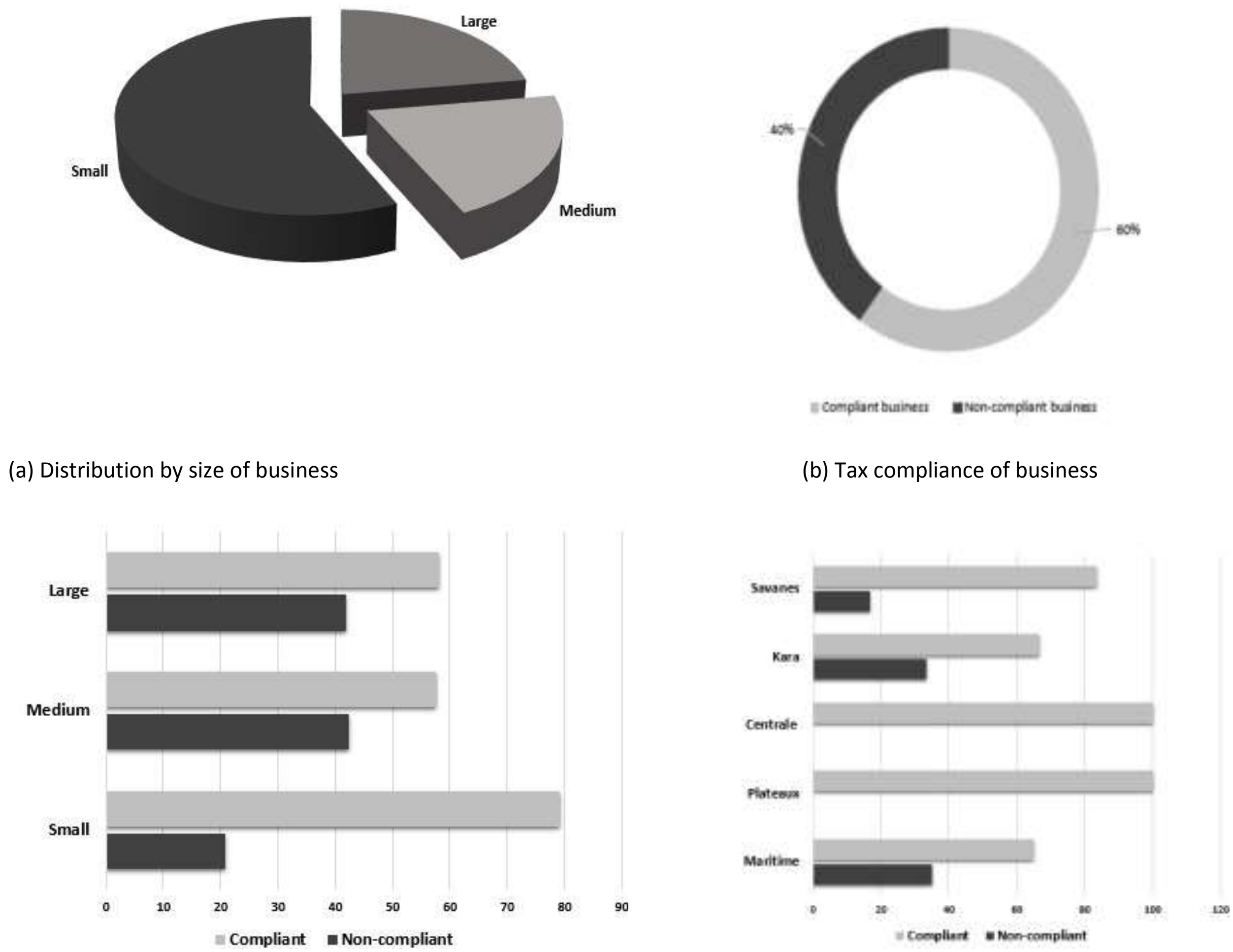
Where **n** is the sample size ; **t** is the normal distribution percentile determined by the specified confidence level, which is one point ninety-six (1.96) (rounded to two (2)) for a ninety-five percent (95%) precision ; **ε** represents the absolute deviation or half of the desired confidence interval for the population; σ_e represents the standard deviation. Considering a 5% precision, the sample size will be :

$$n = \frac{1{,}96^2}{4x(5\%)^2} = 400$$

To control for cases of non-response, we increase our sample size by 25%. Thus, we obtain for the sample size n the value of five hundred (500) firms, that is, three hundred and eighty-five (385) in the Maritime region and one hundred and fifteen (115) in the hinterland.

The collection was carried out using digital tools (tablet, smartphone) over a period of approximately one month, with the cooperation of the collection agents and their supervisors. Data collection was realised with digital equipment (tablet, smartphone) during approximately one month. For this purpose, data entry applications have been developed on CSPRO version 6.3 for data recording. Data transmission from the Collection Agent to the supervisor is done daily via Bluetooth technology to avoid the risk of data loss due to theft or damage of the tablets/smartphone. A dropbox account has been created for each supervisor to centralize the data collected in the field. After the fieldwork, the collected data were exported from CSPro to the STATA software for the auditing work, which focused on checking the quality, relevance and completeness of the data entered ; searching for duplicates and out-of-scope entities ; checking the internal consistency of the data ; and correcting atypical values and entry errors. This task was carried out by means of programs in STATA (do files) and the Microsoft Excel "Pivot Tables" tool. After the data cleaning, the database contains four hundred and thirteen (413) firms instead of the five hundred (500) expected, a response rate of eighty-two point six percent (82.60%).

Table 1 describes explanatory variables which are potential determinants of firm Tax compliance in Togo. Since, the objective of



(a) Distribution by size of business

(b) Tax compliance of business

(c) Tax compliance by size of business

(d) Tax compliance by location regions

Figure 2. Descriptive statistics.
Source: Authors

this study is to identify the factors that influence business tax compliance, we consider two aspects such as business characteristics and tax attitudinal aspect. Firm characteristics refers to size and geographical location. The tax attitudinal aspect includes factors such as: Customs duties legitimacy; Taxes owed knowledge; VAT legitimacy; Severity of penalties; Bribes; Tax beneficiaries; Taxe amount appreciation; Tax fraud appreciation; Tax laws amendment 2019 and Tax burden. These variables constitute the matrix of explanatory variables of our estimation model and whose description and modalities of answers of the firms are summarized in the table below.

Several studies on tax compliance have focused on individual taxpayers compliance instead of firms. They have provided a theoretical framework to explain the factors that affect individual compliance (Fischer et al., 1992; Cuccia, 1994; Devos, 2014). At the same time, some previous studies of business compliance have recognized that individual taxpayers compliance theory can be applied to explain business compliance (Tedds, 2010; Sapiei et al., 2014).

Similarly, Joulfaian (2000) also mentioned that these theories are appropriate, because of the firms managers preferences. He argues that business managers manage the firm's finances in such a way as to have the highest possible profit after paying taxes like an individual person. Based on this premise, we develop the theoretical framework of our study which relates to two categories of variables, business characteristics and tax attitudinal aspects to the tax compliance of businesses. These categories are divided into variables as shown in Figure 3.

Construction of the dependent variable : Tax compliance measure

To compute our tax compliance measure, that is our dependent variable, we rely on the three first questions (Appendix Table 3) asked to the businesses through the questionaire, namely:" (Q501) : Are you currently proud to pay your taxes ?"; "(Q502): If you had the opportunity to pay less by negotiating with an OTR agent for a gift, would you do so ?" and "((Q503): If you had the opportunity to use loopholes in the law to pay less, would you exploit them ?".

To answer these questions, the firms have the possibility either to choose 1 = "Yes" and 2 = "No". In order to have a more consistent dependent variable, we compute it as a composite variable based

Table 1. The explanatory variables description and categorization.

Variables	Description	Classification
Size (of business)	This is the classification of businesses by the Office Togolais des Recettes (OTR) according to turnover : large businesses, medium businesses and small businesses.	Classification according to OTR
Customs duties legitimacy	The opinion of businesses on the appropriateness of taxes, particulary customs duties.	0 = No 1 = Yes
Taxes owed knowledge	The question refers to the knowledge of the provisions of the tax laws, in this case the taxes to which companies are subject.	0 = No 1 = Yes
Geographical location	This is the region where the company is located according to the administrative divisions of the country.	Location in the administrative regions of the country.
VAT legitimacy	The opinion of businesses on the appropriateness of taxes, particulary Value Added Tax (VAT).	0 = No 1 = Yes
Severity of penalties	The opinion of tax audit, probability of detection, and tax penalties are included in the questions.	0 = No 1 = Yes
Bribes	The question refers to the possibility of paying bribes to the tax authorities to pay less tax.	0 = Good 1 = Indifferent 2 = Bad 3 = Very bad
Tax beneficiaries	The question refers to the proper management of collected taxes : the actual destination of the taxes. Do the taxes benefit the whole nation or the public authorities.	0 = To public authorites 1 = To the Togolese nation
Tax amount appreciation	The opinion of businesses on the amount of tax. Is the amount of tax bearable or too high.	1 = Largely bearable 2 = Acceptable 3 = Too high
Tax fraud appreciation	The question refers to the moral value of companies.	0 = Good thing 1 = Indifferent; 2 = Bad 3 = Very bad
Tax burden	The share of taxes in income.	1 = Less than 5%. 2 = Between 5% and 10% 3 = Between 10 and 25% 4 = Between 25 and 50% 5 = More than 50%.
Tax laws amendment 2019	The question refers to knowledge of the provisions of the tax law, in this case the latest 2019	0 = No 1 = Yes

Source:Authors

on the last two questions (Q502 and Q503) to compute a dependent variable that is called Tax Compliance 1. Therefore, Tax Compliance 1 includes businesses that declare to be unwilling to use loopholes in the tax laws and unwilling to ‘negotiate’ with tax collectors to pay less taxes. So, Tax Compliance 1 can be expressed as follows :

$$\textbf{Tax Compliance 1} = \begin{cases} \textbf{1(No, No)} \\ \textbf{0 otherwise} \end{cases} \tag{1}$$

However, since our dependent variable refers to voluntary tax consent, we consider it equally important that our tax compliance measurement takes into account how the taxpayer, the businesses in this case, feel about the taxes they are paying, for example if they are proud to pay taxes or not. Thus, we compute another dependent variable which is Tax Compliance 2, so that this measurement includes firms that are : unwilling to use tax loopholes, unwilling to negotiate with tax collectors to pay lesstaxes, and also proud to pay their taxes. Hence, Tax Compliance 2 is defined as follows:

$$\textbf{Tax Compliance 2} = \begin{cases} \textbf{1(No, No, Yes)} \\ \textbf{0 otherwise} \end{cases} \tag{2}$$

Subsequently, the compliance levels are compared between firms according to their size using the two measures that have been constructed to assess the tax compliance level accurately, which are shown in Figure 4. The idea here is to check whether there is a wide disparity in the degree of tax compliance among firms or not, depending on the indicators used. As we can see, the levels of compliance do not diverge too much, no matter if one uses Tax Compliance 1 or Tax Compliace 2. The difference in tax compliance according to the two indicators is about 12% for small firms and 4% for large and medium firms.

Model estimation

In the econometric specification of the estimation model, the authors assume that there are a set of explanatory variables (denoted as X_i) as described in subsection 3.2 above, that influence firms' tax compliance, that is our dependent variable (denoted as $TaxCompliance_i$). Therefore, the model is specified as follows :

$$TaxCompliance_i = F(X_i) \tag{3}$$

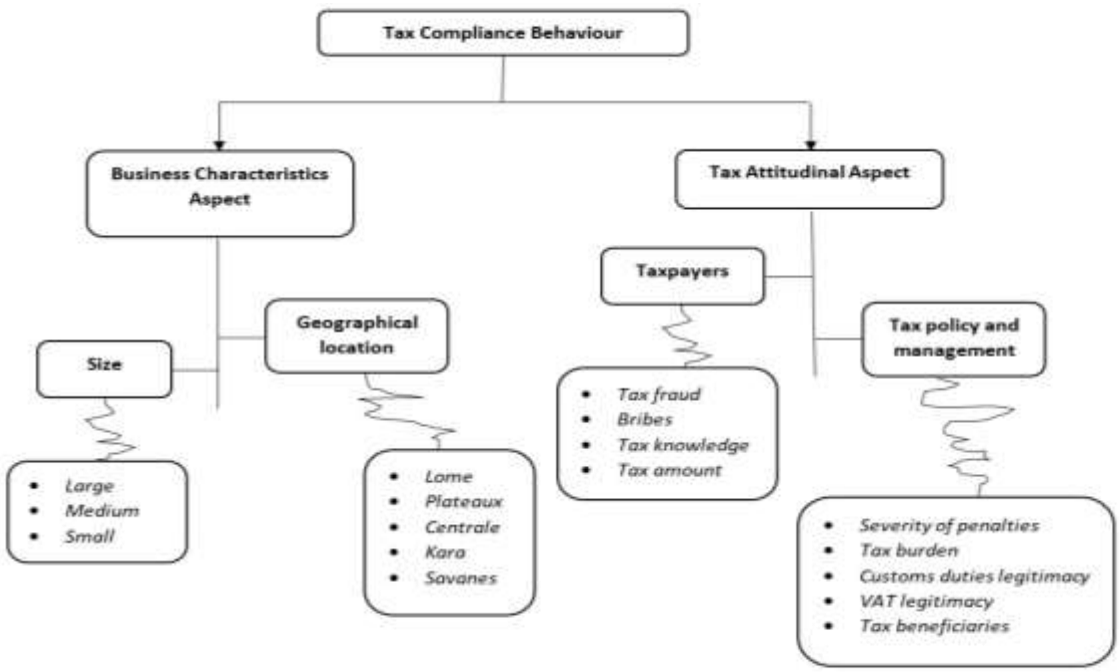


Figure 3. Tax compliance framework.
Source: Authors

Table 2. Baseline model estimates quality adjustment.

	Tax Compliance 1		Tax Compliance 2	
	Good prediction %	**False prediction%**	**Good prediction %**	**False prediction %**
Tax Compliance = 0	78.33	21.67	72.61	27.39
Tax Compliance = 1	62.79	37.21	63.87	36.13
Total	74.50	25.50	69.63	30.37

Source:Authors

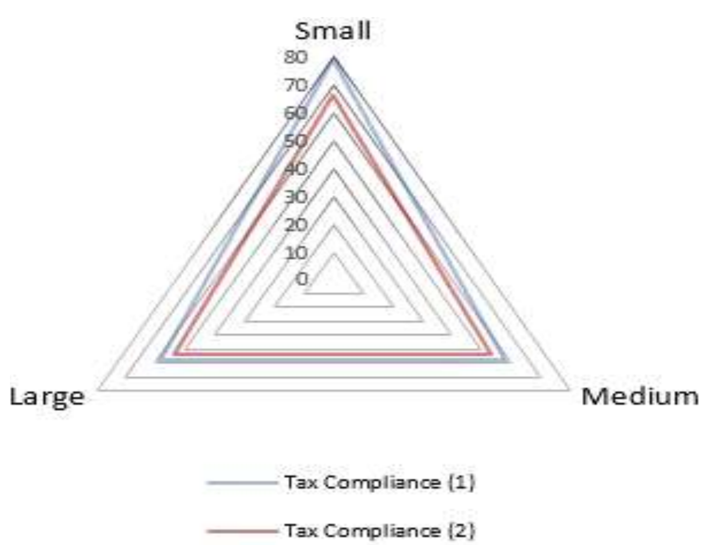


Figure 4. Tax compliance measures by business size.
Source: Authors

Table 3a. Baseline estimates using Tax Compliance 1.

Variable	Tax Compliance 1		
	(1)	(2)	(3)
Geographical location	0.015 (0.573)	0.015 (0.602)	0.013 (0.637)
Size (of business)	-0.237*** (0.000)	-0.243***(0.000)	-0.246*** (0.000)
Tax fraud appreciation (poor)	0.084** (0.024)	0.097** (0.010)	0.097** (0.010)
Bribes (disaproval)	0.145***(0.000)	0.150***(0.000)	0.149***(0.000)
Tax law amendment (2019)	-0.010(0.892)	-0.036(0.624)	-0.034(0.630)
Taxes owed knowledge	0.065(0.380)	0.080(0.284)	0.078(0.296)
Taxes beneficiaries (whole nation)	0.091*(0.088)	0.083(0.126)	0.081(0.137)
Severity of penalties	0.243***(0.001)	0.249***(0.001)	0.252***(0.001)
Customs duties legitimacy	0.155**(0.039)	0.188**(0.014)	0.183**(0.017)
VAT legitimacy	-0.173**(0.003)	-0.153**(0.013)	-0.150**(0.016)
Taxes amount appreciation (too high)	-0.028(0.055)		-0.024(0.621)
Tax burden		0.001(0.978)	0.001 (0.955)
Observations	355	349	349
Wald chi2(11)	77.46	79.60	80.15
Prob > chi2	0.000	0.000	0.000
Pseudo R^2	0.174	0.181	0.182

Marginal effect reported. Probability value in parenthesis. *, **, *** denote significance at 10, 5 and 1%.
Source: Authors

In the case of probability models, the use of Ordinary Least Squares estimation (OLS) is inappropriate for several reasons, including that the estimated value of $TaxCompliance_i$ is outside the interval [0,1]. In addition, it is also possible that the idiosyncratic error does not follow a normal distribution but a discrete distribution because it can only take two values (0 and 1). In such cases, it is appropriate to identify the impact of variable *X* on the probability of firm to be compliant. For this purpose, equation 3 can be rewritten as follows

$$\begin{cases} Pr(TaxCompliance_i = 1|X_i) = F(X_i) \\ Pr(TaxCompliance_i = 0|X_i) = 1 - F(X_i) \end{cases} \quad (4)$$

In related empirical literature, Logit and Probit estimators are often used to estimate these probability models (Abdu, et al., 2020; Ibrahim et al., 2015; Gbadago and Awunyo-Vitor, 2015; Bilgin, 2014; Serim and Ya˘gano˘glu, 2017; Alm et al., 1993). But, the choice between them depends on the idiosyncratic error distribution function. The probit estimator is recommended when the error distribution function follows a normal distribution. In contrast, when the error distribution function is assumed to follow a logistic distribution, then the logit estimator is recommended. However, according to Greene (2002), the logit and probit models are very similar. And the matter of choice is therefore irrelevant. However, this study focuses on the probit model mainly because of its ability to limit the value of variable within 0 and 1, and its ability to correct for heteroscedasticity in the model (Gbadago and Awunyo-Vitor, 2015).

RESULTS AND DISCUSSION

Baseline model estimates

The predictive quality of the model is summarized in Table 3, which presents statistics on the predictive quality of the model for each of the dependent variables. For example, the model has a predictive quality of 74.5% using Tax Compliance 1 as the dependent variable (column 1) and 69.6% for Tax Compliance 2 as the dependent variable (column 3). Similarly, it is also possible to obtain the quality of adjustment by the ROC Curve presented in Appendix Figures 1 and 6. For the two dependent variables Tax Compliance 1 and Tax Compliance 2, the “Area under the ROC Curve” statistics confirm a high quality of adjustment, of 78% and 77%, respectively. To detect the presence or absence of multicollinearity of the independent variables in our model, we calculated the Variance Inflation Factor (VIF).

The VIF results were generally below 5, which indicate that multicollinearity is not an issue in the model. The threshold value commonly used to indicate the presence of multicoloniarity is a tolerance value is (1/VIF) <0.10 or equal to VIF> 10 (Nugroho and Zulaikha, 2012). Appendix Table 2 shows that the VIF of our explanatory variables are less than 10 (VIF < 10) and the inverse of the VIF is greater than 0.10 (1/VIF > 0.10). Therefore, it can conclude the absence of multicollinearity of our independent variables.

Factors that explain tax compliance of businesses in Togo

Having identified the potential factors that influence voluntary tax compliance in Togolese companies and through the use of probit models, we estimate our

Table 3b. Baseline estimates using tax compliance 2.

Variable	Tax compliance 2		
	(1)	**(2)**	**(3)**
Geographical location	0.059*(0.054)	0.055*(0.078)	0.051*(0.098)
Size (of business)	-0.206***(0.000)	-0.202***(0.000)	-0.213***(0.000)
Tax fraud appreciation (poor)	0.111**(0.010)	0.122***(0.005)	0.122***(0.005)
Bribes (disaproval)	0.109***(0.008)	0.109***(0.007)	0.106***(0.009)
Tax law amendment (2019)	-0.015(0.848)	-0.025(0.754)	-0.023(0.780)
Taxes owed knowledge	0.161**(0.051)	0.172**(0.039)	0.170**(0.042)
Taxes beneficiaries (whole nation)	0.221***(0.000)	0.220***(0.000)	0.214***(0.000)
Severity of penalties	0.214***(0.004)	0.208***(0.005)	0.218***(0.004)
Customs duties legitimacy	0.137*(0.084)	0.157**(0.050)	0.142*(0.074)
VAT legitimacy	-0.192**(0.006)	-0.185**(0.011)	-0.180**(0.014)
Taxes amount appreciation (too high)	-0.079(0.139)		-0.071(0.186)
Tax burden		-0.010(0.684)	-0.007(0.750)
Observations	355	349	349
Wald chi2(11)	83.00	80.14	81.94
Prob > chi2	0.000	0.000	0.000
Pseudo R2	0.179	0.174	0.178

Marginal effect reported. Probability value in parenthesis. *, **, *** denote significance at 10, 5 and 1%.
Source: Authors

baseline models using two dependent variables. The results are presented in Table 3a and 3b. In Table 3a, the dependent variable Tax Compliance 1 includes businesses that declare to be unwilling to use loopholes in the tax laws or not to negotiate with tax collectors to pay less tax. Table 3b, the dependent variable Tax Compliance 2 includes businesses that declare to be unwilling to use loopholes in the tax laws or not to negotiate with tax collectors to pay less tax and are proud to pay their taxes. Column 1 and 2 (Table 4a and 4b) include two proxies for tax burden used in an alternative manner, while column 3 includes both. Using stata 17, the findings show that some variables significantly explain the tax compliance of businesses.

Tax compliance 1 - findings

Considering Tax Compliance 1 as the dependent variable, the findings reveal number of patterns. The first statistically important factor is the size of business. A negative statistical relationship was found between the business size and tax compliance. The associated marginal effect indicates that, large businesses are 23.7% less likely to be compliant than small businesses. This result is in line with that of Abdul-Jabbar (2009), but in contrast with Mohamad and Deris (2018) and Mohd Nor et al. (2010) who found that business size influences tax compliance posetively due to the effective internal controlling within the firms. It implies that large businesses have strict procedure for monitoring of financial reporting, due to which they report their taxes properly. Moreover, large businesses must also maintain their reputation towards their business partners, so they will be more obedient than smaller firms (Azrina Mohd Yusof, 2014). In addition, Nur-Tegin (2008) also argues that large businesses are more likely to be compliant than small businesses. He explains that they are the main targets of tax officers to boost tax revenue. It means that larger businesses have greater potential to increase revenue than smaller businesses, so it becomes easy for small firms to be invisible. Therefore, based on previous research, it can be easily concluded that the internal monitoring within firms in Togo is very low both in small, medium or large businesses. In addition, the level of tax audit conducted by OTR is not up to the mark, so the bigger firms still have the tendency to evade taxes. Most large businesses benefit from foreign capital, which gives them opportunities to reduce taxes through tax havens. Similarly, they can also overcharge salaries and other expenses to increase costs and minimize their taxes (Kemme et al., 2020). Finally, large businesses also have enormous power to negotiate for exceptional concession. However, some different findings upon the influence of firm size toward compliance refer to different proxy used by researchers.

"Similar to Mohd Nor et al. (2010), this study divides the firms' size according to their turnover, while some use the number of employees (Nur-Tegin, 2008)."

The second and third statistically important factors are tax fraud appreciation and bribes and they have positive effects on businesses' tax compliance. These two

Table 4a. Robustness checking using tax compliance 1 (Firm size).

Variable	(1) Small	(2) Medium	(3) Large	(4) Exclu. small	(5) Baseline
Geographical location	0.015(0.377)				0.013(0.637)
Tax fraud appreciation (poor)	0.108***(0.003)	0.023(0.785)	0.041(0.629)	0.065(0.262)	0.097**(0.010)
Bribes (disapproval)	0.124***(0.000)	0.159*(0.054)	-0.044(0.630)	0.093(0.129)	0.149***(0.000)
Tax law amendment (2019)	-0.003(0.969)	-0.266(0.105)	0.207(0.301)	-0.051(0.699)	-0.034(0.630)
Taxes owed knowledge	0.146**(0.016)	-0.124(0.566)	0.319**(0.044)	0.232*(0.084)	0.078(0.296)
Taxes beneficiaries (whole nation)	-0.060(0.295)	-0.043(0.730)	0.185(0.142)	0.118(0.146)	0.081(0.137)
Severity of penalties	0.124**(0.097)	0.569***(0.000)	0.466***(0.000)	0.504***(0.000)	0.252***(0.001)
Customs duties legitimacy	0.205***(0.000)		0.027(0.939)	0.224(0.386)	0.183**(0.017)
VAT legitimacy	-0.010**(0.021)		0.135(0.673)	-0.362**(0.050)	-0.150**(0.016)
Taxes amount appreciation (too high)	-0.061(0.215)	-0.119(0.237)	0.027(0.812)	-0.052(0.482)	-0.024(0.621)
Tax burden	0.022(0.337)	0.023(0.669)	0.045(0.359)	-0.008(0.829)	0.001(0.955)
Observations	174	81	91	175	349
Wald chi2(..)	56.59	15.65	15.95	23.88	80.15
Prob > chi2	0.000	0.048	0.010	0.008	0.000
Pseudo R2	0.399	0.184	0.128	0.133	0.182

Marginal effect reported. Probability value in parenthesis. *, **, *** denote significance at 10, 5 and 1%.
Source: Authors

Table 4b. Robustness checkin using tax compliance 2 (Firm size).

Variable	(1) Small	(2) Medium	(3) Large	(4) Exclu.small	(5) Baseline
Geographical location	0.056*(0.000)				0.051*(0.098)
Tax fraud appreciation (poor)	0.239***(0.000)	0.025(0.765)	-0.002(0.984)	0.052(0.389)	0.122***(0.005)
Bribes (disapproval)	0.089*(0.081)	0.151*(0.086)	0.003(0.971)	0.082(0.193)	0.106***(0.009)
Tax law amendment (2019)	0.034(0.726)	0.323**(0.050)	0.238(0.245)	-0.102(0.462)	-0.023(0.780)
Taxes owed knowledge	0.248***(0.005)	-0.159(0.486)	-0.060(0.816)	-0.087(0.614)	0.170**(0.042)
Taxes beneficiaries (whole nation)	0.116(0.147)	0.140(0.264)	0.276**(0.025)	0.200**(0.013)	0.214***(0.000)
Severity of penalties	0.105(0.277)	0.497***(0.000)	0.481***(0.000)	0.486***(0.000)	0.218***(0.004)
Customs duties legitimacy	0.240***(0.001)		-0.063(0.857)	0.134(0.619)	0.142*(0.074)
VAT legitimacy	-0.199**(0.005)				-0.180**(0.014)
Taxes amount appreciation (too high)	-0.199**(0.011)	-0.116(0.256)	0.038(0.737)	-0.051(0.503)	-0.071(0.186)
Tax burden	-0.020(0.557)	0.001(0.985)	-0.035(0.490)	-0.012(0.735)	-0.007(0.750)
Observations	174	81	89	171	349
Wald chi2(..)	59.28	14.66	14.25	21.62	81.94
Prob > chi2	0.000	0.066	0.013	0.010	0.000
Pseudo R2	0.328	0.179	0.162	0.140	0.178

Marginal effect reported. Probability value in parenthesis. *, **, *** denote significance at 10, 5 and 1%.
Source: Authors

variables measure the ethics and morals of firms in comparison to their compliance with tax laws. They are categorized in order from good to very bad accordingly. These results suggest that businesses believing that tax evasion and bribing tax collectors to pay less taxes is wrong, are more likely to be compliant. The respective marginal effects are 9.7% and 14.9% meaning that such firms are more likely to comply with their tax obligations. Thus, a reduction in corruption by tax collectors of the OTR can increase business compliance in Togo. This result is consistent with Alm and McClellan (2012) who argue that, a corrupt tax administration system (due to bribes) reduces reporting and so increases tax evasion.

The authors underline that reducing corruption in tax administration improves corporate tax compliance.

Tax beneficiaries would be positively and significantly correlated with businesses' tax compliance. Thus, firms that believe that taxes benefit the whole nation are more willing to pay than those who believe that taxes benefit the public authorities ~~,~~ only. The associated marginal effect indicates that firms that believe taxes benefit the nation as a whole are 9.1% more likely to be compliant than firms that believe taxes benefit public authorities. This means that good management of tax revenues encourages firms to participate in the financing of public goods by paying their taxes. Also, better explanation of the origin of the resources collected would enable the taxpayer to better understand the need for the institution of a tax and thus to freely consent to pay taxes (Fjeldstad and Semboja, 2001).

The results also point to a positive and significant association between the severity of penalties and tax compliance. This implies that high penalties will surely generate more corporate tax compliance in Togo. According to the associated marginal effect, there is 25.2% chance that high penalties will force firms to comply with tax legislation. This result is in contradiction with Andreoni et al. (1998) who claimed that the compliance rate will remain high in the modern tax system even though tax sanctions are low because there are other factors which effect the compliance, like non economic factors (human behaviour). This reason is also supported by Falanni (2015) who summarized that the important factors to increase the voluntary compliance are through the improvement of moral and ethics of the taxpayers rather than imposing high penalties. The positive effect of the severity of sanctions on companies tax compliance is also associated with more regular tax audits, thus a higher probability of being caught. The process of audit in Togo for businesses is based on certain selection criteria in which all firms are not included. But, some firms selected are mostly based on their suspicious history or reporting transactions below the amount aggregated in the OTR's books. The audit selection is also correlated with the size of the businesses, then, it will influence compliance (Falanni, 2015). Large businesses are more eligible for the audit, as they are the major taxpayers to the OTR. However, the OTR is making an effort to audit as many firms as possible over a period of 3 years, the statute of limitations beyond which tax fraud is no longer reprehensible.

Furthermore, we also find that custom duties legitimacy is positively and significantly related to businesses' tax compliance. This means that taxpayers who find custom duties legitimate are more willing to pay than those who do not. Firms that find tariffs legitimate are 18.3% more likely to be compliant. Contrary to custom duties, VAT legitimacy has been negative in connection with businesses' tax compliance. In terms of marginal effect, there is a 15% lower chance that businesses which find VAT legitimate are not compliant. This negative relationship can be attributed to various imperfections in VAT implementation in the country, particularly to non-fluid refunds of VAT credits. This result is not consistent with our expectations. One would think that firms which believe in VAT legitimacy are more willing to pay. So, how can we explain this contradictory result ? Let's take for example small businesses that bear VAT paid because of the non-fluid repayment of VAT credits in developing countries. It should be recalled that by definition small businesses are not registered for VAT, therefore they are not entitled to charge VAT on sale, and consequently cannot deduct the amount of VAT paid on purchase of inputs, imports etc. However, These small businesses sometimes or very often bear the amount of VAT paid, which increases their production costs making them less competitive. It is possible, therefore, that these difficulties experienced by small businesses may lead to deviant behaviour *vis-a-vis* tax compliance. Moreover, avoiding tax obligations is an acceptable argument to explain the negative relationship between the legitimacy of VAT and tax compliance in small businesses as they represent a significant share of our sample, 56.9%.

Tax compliance 2 - findings

However, our study has not found any significant relationship between tax compliance and the variables geographical location, tax laws amendment (2019), tax burden, tax owed knowledge, and tax amount appreciation while using the dependent variable Tax Compliance 1. But some of them become significant when we use Tax Compliance 2 as the dependent variable. This is another measure of tax compliance that includes firms that are unwilling to use tax loopholes, unwilling to negotiate with collectors to pay less tax, and are also proud to pay their taxes.

It can be seen that all the factors that significantly explain Tax Compliance 1 in Table 4 also explain the alternative measure that is, Tax Compliance 2. Furthermore, a weak (one star (*)), medium (two stars (**)) and strong (three stars (***)) positive statistical significance can be found in other factors such as geographical location, knowledge of the law, and tax beneficiary respectively.

Concerning the variable geographical location, we have found a potential positive association with tax compliance. The implication of the result is that the firms furthest from the capital are the most compliant. The estimated marginal effect is 5.1% meaning that firms located in other regions are 5.1% more likely to be compliant than those in the *Maritime* region. There are several reasons for such correlation. In this respect, it could be assumed that it is easier to control firms located outside the *Maritime* region due to their extremely low numbers. Since there is a high concentration of firms in the *Maritime* region, this could make tax controls more

Figure 5. Administrative map and sample distribution.
Source: Authors

complex, and therefore enhance tax avoidance behavior of firms.

Moreover, the coefficient of tax laws knowledge positively impacts corporate tax compliance. According to the associated marginal effect, firms that know the tax laws are 17% more likely to be compliant than those that do not. Previous studies have shown evidence that tax knowledge has a very close relationship with taxpayers' ability to understand the laws and regulations of taxation, and their ability to comply with them (Singh and Bhupalan, 2001).

Finally, a positive correlation was found between tax compliance and tax beneficiaries. This variable contains those firms which consider that taxes paid give profit to the whole nation. According to the associated marginal effect, these firms are 21.4% more likely to be tax compliant.

Robustness tests

We do not present the results of the robustness tests in the paper, but we have tested for differences in tax compliance depending on business size, and for variations in tax compliance among different administrative regions. The nature of these results, in our opinion, is linked to the distribution of the sampled businesses across the country, according to which the *Maritime* region alone accounts for more than 84%. Therefore, the non-representatives of businesses in the other regions (Figure 5) does not allow us to predict a statistically valid relationship between tax compliance and belonging to a given administrative region in the country.

Moreover, this unequal distribution of the sample in the different administrative regions makes it necessary to reconsider the *Maritime* region as an isolated entity and to re-examine the tax compliance of businesses in this region. In total, 349 out of the 413 businesses surveyed are located in this region. Thus, we first investigate the factors that determine tax compliance of businesses in the *Maritime* region and then test whether there are differences in tax compliance according to the size of the businesses in the region.

Does firm size matter to tax compliance in Togo ?

The results of the estimation of the factors explaining tax compliance by business size are presented in Table 4. Accordingly, the determinants vary depending on whether the business is of small, medium or large size.

For small businesses, no matter which dependent variable is used, the variables such as tax fraud appreciation, bribes, tax knowledge, and customs duties legitimacy positively influence tax compliance of small businesses, while VAT legitimacy is associated with an incentive to allow/pursue tax avoidance on the part of small businesses.

Furthermore, the severity of penalties also encourage small businesses to be compliant but only in the model using Tax Compliance 1 (Table 4a). Finally, for small businesses, geographical location has a positive influence on compliance while the appreciation of the amount of tax has a negative effect, but only the model including Tax Compliance 2 predicts these relationships. The results in columns 2 of each Table 4 provide evidence on the factors that determine the tax compliance of medium-sized businesses. They indicate that the bribes to deal with taxes and the severity of penalties are the determining factors with an incentive effect. The results are the same for both dependent variables. For large businesses, compliance is enforced in the presence of severe penalties whether the dependent variable considered is Tax Compliance 1 or 2. In addition, knowledge of the taxes to which one is subject (with Tax Compliance 1) leads to evasion of tax compliance, while the fact of considering that the tax will benefit the whole nation (with Tax Compliance 2) encourage large businesses to respect tax compliance.

Additionally, in order to compensate for the low number of medium and large businesses compared to small businesses, we perform a new estimation in which

Table 5a. Robustness checking using tax compliance 1 (Regional effects).

Variable	(1) Maritime	(2) Small	(3) Medium	(4) Large
Size (of business)	-0.240***(0.000)			
Tax fraud appreciation (poor)	0.064(0.157)	0.67(0.306)	0.023(0.781)	0.041(0.629)
Bribes (disapproval)	0.116**(0.012)	0.089*(0.070)	0.208**(0.013)	-0.044(0.630)
Tax law amendment (2019)	0.014(0.866)	0.097(0.335)	-0.176(0.286)	0.207(0.301)
Taxes owed knowledge	0.045(0.620)	0.184*(0.056)	-0.228(0.175)	-0.319**(0.044)
Taxes beneficiaries (whole nation)	0.067(0.300)	-0.283**(0.029)	0.086(0.485)	0.185(0.142)
Severity of penalties	0.317***(0.000)	0.204**(0.056)	0.506***(0.000)	0.466***(0.000)
Customs duties legitimacy	0.188**(0.055)	0.366***(0.000)		0.027(0.939)
VAT legitimacy	-0.138(0.110)	-0.153***(0.007)		0.135(0.673)
Taxes amount appreciation (too high)	-0.023(0.685)	-0.054(0.612)	-0.083(0.401)	0.027(0.812)
Tax burden	-0.010(0.698)	0.044(0.197)	0.027(0.631)	-0.045(0.359)
Observations	289	114	84	91
Wald chi2(..)	55.02	46.52	15.06	15.95
Prob > chi2	0.000	0.000	0.058	0.101
Pseudo R2	0.139	0.370	0.183	0.128

Marginal effect reported. Probability value in parenthesis. *, **, *** denote significance at 10%, 5% and 1%.
Source: Authors

medium and large businesses are included. The results are in the columns 4 of both tables 4a and 4b, similar to those for large businesses. The only notable difference is that the legitimacy of VAT becomes significant and negative, indicating that medium and large businesses that find VAT legitimate are not willing to pay it. The idea of non-fluid refunds of VAT credits is still admissible to explain VAT evasion by these businesses, although they would be taxable unlike small businesses.

Lastly, it can be observed that in columns 5 of these Tables (4a and 4b) the baseline models are still reported. The idea is to compare the results according to the size of businesses to the baseline model in order to shed light on the idea that the determining factors identified in the later are not influenced by the high number of small businesses in our sample. Clearly, the results of the reference model are similar to those of small businesses, although some of the factors determining the tax compliance in the reference model are not in accordance with the small businesses or *vice versa*. For example, in the reference model, tax beneficiaries provide an incentive to comply with but do not determine compliance for small businesses according to the two dependent variables (Tax Compliance 1 and 2). Conversely, tax owed knowledge (Tax Compliance 1) and tax amount appreciation (Tax Compliance 2) significantly explain small business compliance but do not explain in the baseline model.

However, by definition, this simply explains the concentration of Togo's businesses in the most developed region, and it is this reality that is reflected in the composition of the sample in terms of geographical location.

Robustness check focusing on the Maritime region

We therefore focus on the Maritime region, which includes 349 of the total 413 surveyed businesses, and identify the factors explaining voluntary tax compliance, as well as the determinants by business size within this region. Table 5a and 5b presents the analysis of the determinants of tax compliance, by business size.

Some factors significantly explain voluntary compliance regardless of the dependent variable used. For example, the size of the business is associated with non-compliance that is in the *Maritime* region, large businesses are more likely to avoid paying taxes. While the more severe the penalties imposed by the tax authorities, the more compliant businesses tend to be. Other factors are only significant in a particular model. It is the case of bribes and legitimacy of custom duties that are found to push businesses towards voluntary compliance in the model using Tax Compliance 1. By contrast, in the model with Tax Compliance 2, knowledge of the tax laws, and the taxes beneficiary, positively influences voluntary compliance while businesses find VAT legitimate but are not willing to pay it.

We can say that factors that are key determinants of tax compliance at national level are not all significant at the regional level. It means that there would be a regional effect that would be interesting to investigate further, but unfortunately we could not carry out this analysis due to data constraints as we already mentioned.

The first finding that emerges from the estimates by business size is that, among small businesses, regardless of the dependent variables we consider, factors such as knowledge of the tax laws, legitimacy of

Table 5b. Robustness checking using Tax Compliance 2 (Regional effects).

Variable	(1) Maritime	(2) Small	(3) Medium	(4) Large
Size (of business)	-0.200***(0.000)			
Tax fraud appreciation (poor)	0.072(0.146)	0.209**(0.037)	0.025(0.765)	-0.015(0.865)
Bribes (disapproval)	0.071(0.133)	-0.016(0.841)	0.197**(0.026)	0.010(0.918)
Tax law amendment (2019)	0.019(0.839)	0.143(0.286)	-0.242(0.147)	0.255(0.179)
Taxes owed knowledge	0.160*(0.098)	0.298**(0.020)	-0.258(0.164)	0.048(0.843)
Taxes beneficiaries (whole nation)	0.236***(0.000)	0.171(0.142)	0.177(0.147)	0.296**(0.014)
Severity of penalties	0.261***(0.001)	0.146(0.256)	0.436**(0.002)	0.464***(0.000)
Customs duties legitimacy	0.136(0.167)	0.272**(0.018)		-0.087(0.801)
VAT legitimacy	-0.189*(0.046)	-0.312***(0.002)		
Taxes amount appreciation (too high)	-0.077(0.207)	-0.319**(0.016)	-0.084(0.406)	0.025(0.830)
Tax burden	-0.017(0.551)	-0.017(0.731)	0.004(0.940)	-0.035(0.491)
Observations	289	114	84	91
Wald chi2(..)	55.80	42.27	14.77	14.53
Prob > chi2	0.000	0.000	0.064	0.105
Pseudo R2	0.143	0.304	0.178	0.170

Marginal effect reported. Probability value in parenthesis. *, **, *** denote significance at 10, 5 and 1%.
Source: Authors

custom duties and VAT are found to be determinants of voluntary compliance. In contrast to the others, which push for compliance, VAT legitimacy leads to tax avoidance. After that, it can be pointed out that factors such as bribes, tax beneficiaries and severity of penalties are also significant in the specification with Tax Compliance 1. If compliance is negatively influenced by the tax beneficiaries, it is enhanced by factors like bribes and severity of penalties. In addition, the tax fraud and taxes amount appreciation is also relevant in the specification with Tax Compliance 2. More specifically, the amount of the tax induces tax avoidance, whereas the tax fraud appreciation rather encourages compliance with tax obligations.

For medium-sized businesses, the results are identical in both specifications. Therefore, variables such as bribes and the severity of penalties are positive and significant i.e. these factors accelerate voluntary compliance.

Finally, for large businesses, three valid determinants were identified. The severity of penalties is positive and significant in both specifications. It would be an accelerating factor for voluntary compliance. It is tax knowledge that is associated with tax avoidance in the specification using Tax Compliance 1 but unlike tax beneficiaries which rather favour voluntary compliance according to the specification Tax Compliance.

CONCLUSIONS AND POLICY IMPLICATIONS

In this paper, factors that contribute to the compliance of businesses have been highlighted with their tax obligations in Togo. The model defines voluntary tax compliance behaviour based on two aspects, that is characteristics of businesses (size and geographical location) and tax attitudinal aspects (attitudes of taxpayers, tax policy and management). The tax compliance of businesses was captured in two different ways according to their responses to the surveys that were administered to them. The first measure we define is Tax Compliance 1, which includes businesses that declare that they do not want to use loopholes in the tax laws or negotiate with tax collectors to pay less tax. The second measure, Tax Compliance 2, includes businesses that not only declare themselves unwilling to use tax loopholes or negotiate with tax collectors to pay less tax, but are also proud to pay their taxes. Several factors have been identified as potential candidates for determining voluntary tax compliance. These include factors such as bribes, severity of penalties, legitimacy of customs duties, geographical location, tax evasion appreciation, tax burden, amendment of the tax laws, tax paid, tax knowledge, tax beneficiaries, legitimacy of VAT and size of businesses.

Most results are in line with expectations. On the one hand, the study concluded that geographical location, tax evasion assessment, bribes, tax knowledge, tax beneficiaries, the severity of penalties and the costs of legitimate custom duties are factors that incite businesses to pay taxes voluntarily. Additionally, the size of a business and the legitimacy of VAT are more likely to be linked to tax evasion. Initially, it did not seem logical to us that the legitimacy of VAT should be associated with any attempt at tax evasion. Nevertheless, while VAT is intended to be neutral for businesses, its application through VAT policy and the operation of tax administrations in developing countries often leads some businesses to evade their tax obligations.

Furthermore detailed analysis by business size showed that the determinants of tax compliance of small businesses are not the same as those of medium and large businesses. We also found a regional effect of the determinants of Togolese businesses' tax compliance. For businesses located in the *Maritime* region, their determinants differ from those identified at the national level. Unfortunately, the analysis could not be carried out at the level of the other administrative regions of the country because the data we have did not allow it. In view of these conclusions, some recommendations can be made to improve the tax compliance of businesses in Togo.

First of all, it is imperative that the OTR works to improve the conditions of application of VAT. In terms of VAT policy, for social reasons, many goods and services are exempted from VAT, either completely or partially. For example, these exemptions are at the origin of VAT credit creation. When these credits are not reimbursed (as is the case of small non-taxable businesses because their turnover is below the required threshold) or not reimbursed quickly or not totally (as is often the case for medium and large taxable businesses), this weighs on businesses in terms of the costs they have to bear on production. This automatically undermines the efficiency of the tax system. It would therefore be very useful for the tax administration to reduce, as far as possible, the multiple exemptions in favour of targeted assistance to the vulnerable households, as was the case with the Novissi program, initiated during the COVID-19 crisis by the Togolese government, a program hailed by the 2019 Nobel Economics Prize winners Abhijit Banerjee and Esther Duflo. In addition, it is essential to set up a fluid mechanism for the reimbursement of VAT credits, so that VAT is only borne by final consumers and effectively neutral for businesses.

Secondly, the OTR must also acquire more technical, human and financial resources in order to carry out proper tax audits and identify firms that sometimes make false declarations or attempt to circumvent the tax laws in order to avoid paying taxes.

Given the idea of future research, it would be interesting to include more firms located in the other regions, in order to better analyze the regional effect of factors that underline the voluntary tax compliance of the firms. In this way, we could have the determinants of tax compliance in each of the five administrative regions of the country. It would also be useful to compare the tax compliance of foreign companies with that of domestic firms, but the database used in this paper does not differentiate between foreign and domestic owned firms. Another important extension will be to distinguish between firms according to their activities (production of goods and/or services) as well as their sectors of activity (agriculture, agro-industry, construction, transport, telecommunications, etc.) in order to draw lessons in terms of tax policy, control and tax collection for a better efficiency of the tax system. Finally, it will also be important to examine whether certain tax policies, such as tax credits for certain firms, are an instrument for tackling tax evasion.

Another limitation of this work is that of all studies conducted with survey data, that of the honesty of the respondents. Nevertheless, all the procedures in the survey have been respected to minimize this risk.

CONFLICT OF INTERESTS

The authors have not declared any conflicts of interests.

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Appendix Table 1. Descriptive statistics.

Variable	Obs	Mean	Std.Dev.	Min	Max
Tax compliance	361	0.687	0.464	0	1
Geographical location	413	1.392	1.027	1	5
Business size	413	1.656	0.823	1	3
Tax fraud appreciation	360	2.356	0.685	0	3
Bribes to Deal with Taxes	397	2.327	0.717	0	3
Tax laws amendment (2019)	367	0.548	0.498	0	1
Tax knowledge	401	0.658	0.475	0	1
Tax beneficiaries	361	0.468	0.500	0	1
Severity of penalties	400	0.777	0.416	0	1
Customs duties legitimacy	400	0.725	0.447	0	1
VAT legitimacy	400	0.848	0.360	0	1
Taxes amount appreciation	402	2.410	0.691	1	3
Tax burden	396	2.720	1.260	1	5

Appendix Table 2. Variance inflation factor (VIF).

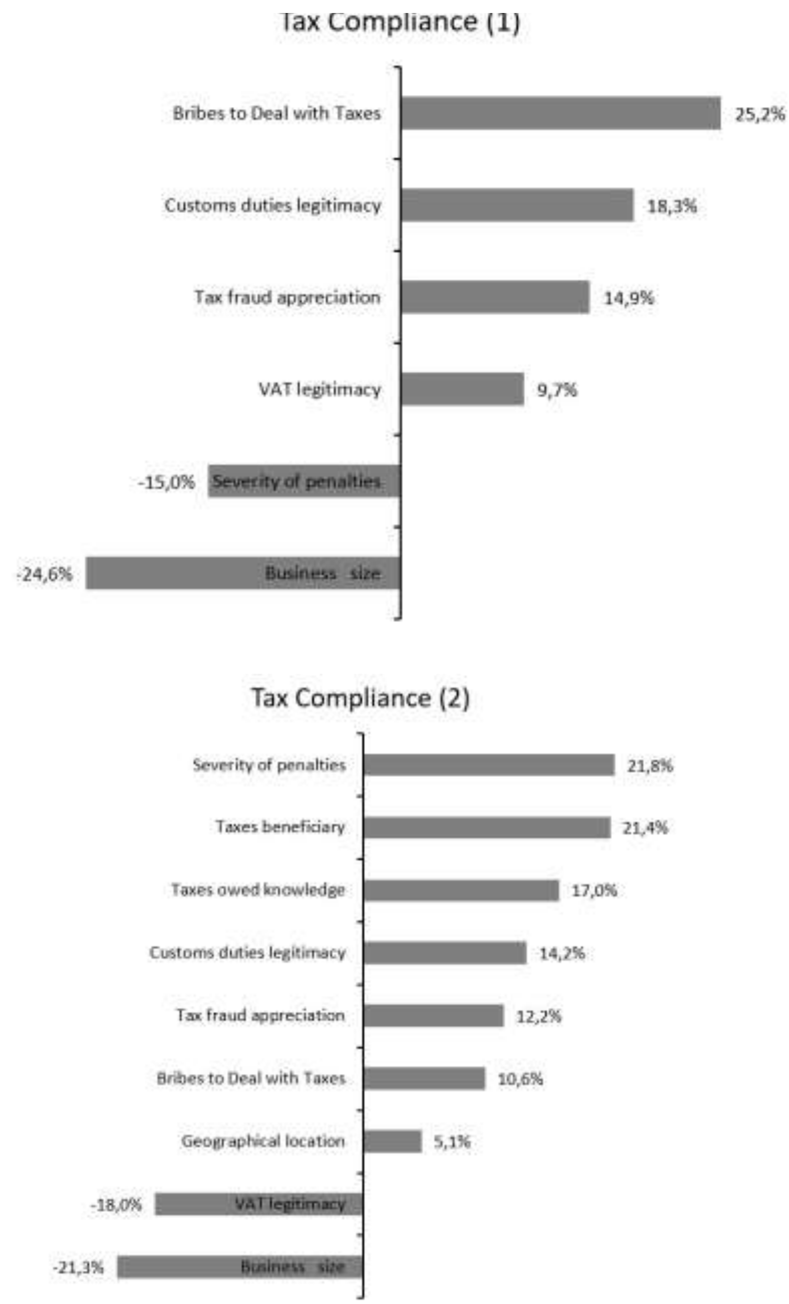
Variables	VIF	1/VIF
Tax laws amendment (2019)	2.00	0.500
Business size	1.96	0.509
Customs duties legitimacy	1.62	0.617
Taxes owed knowledge	1.60	0.626
Geographical location	1.37	0.732
VAT legitimacy	1.29	0.775
Severity of penalties	1.22	0.820
Bribes to Deal with Taxes	1.20	0.835
Tax beneficiaries	1.19	0.840
Taxes amount appreciation	1.11	0.898
Tax fraud appreciation	1.11	0.901
Tax burden	1.07	0.933

Appendix Table 3. Surveys administered to businesses.

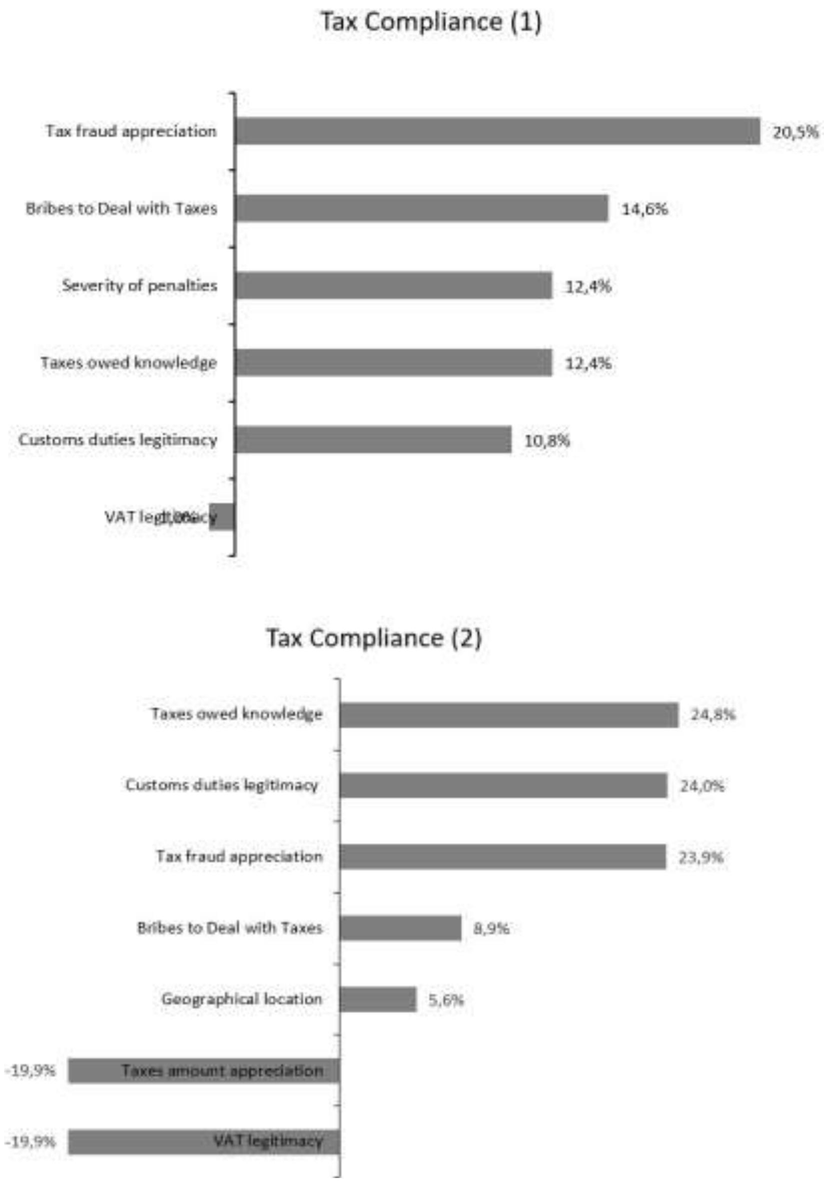
Variables	Questions	Modalities
Tax compliance (Q501)	If you had the opportunity to pay less by negotiating with an OTR collectors for a gift, would you do it ?	1 = Yes 2 = No
Tax compliance (Q502)	If you had the opportunity to use gaps in the law to pay less, would you exploit them ?	1 = Yes 2 = No
Tax compliance (Q503)	Are you currently proud to pay your taxes ?	1 = Yes 2 = No
Tax fraud appreciation (Q511)	Do you think a citizen should use gaps in the law to pay less tax ?	1 = Very poor 2 = Poor 3 = Indifferent 4 = Good
Bribes (Q512)	How do you judge negotiation with OTR collectors to pay less tax ?	1 = Very poor 2 = Poor 3 = Indifferent 4 = Good

Appendix Table 3. Cont'd

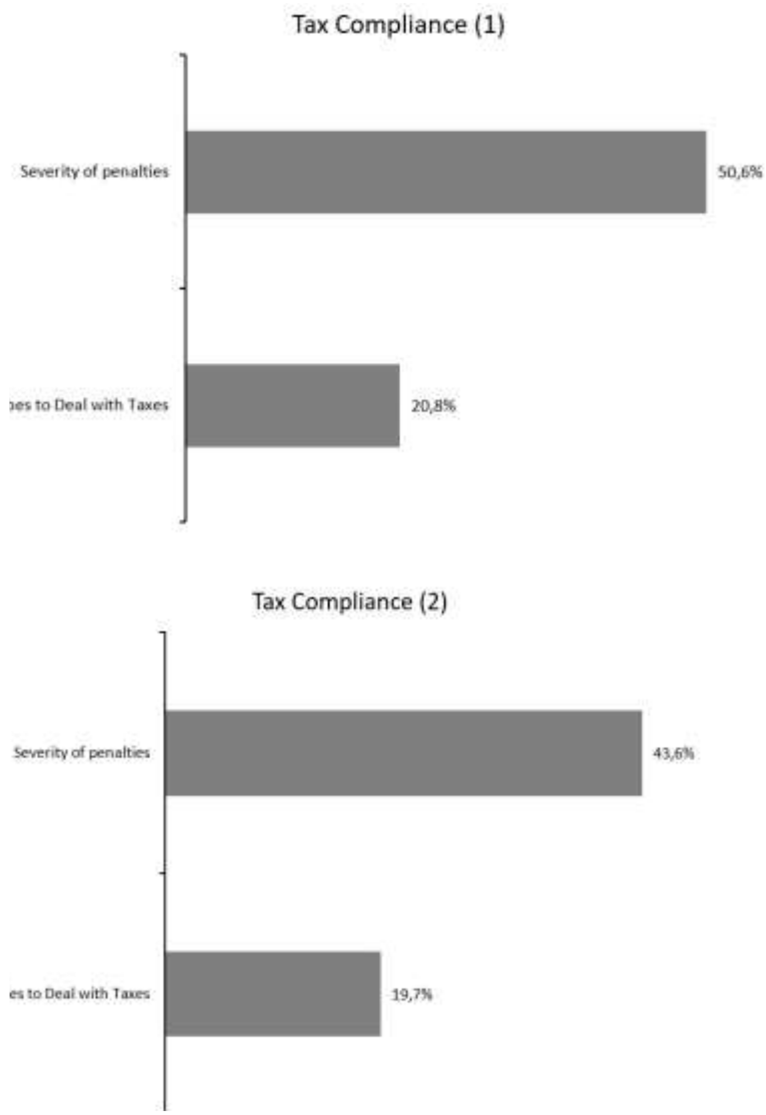
Tax laws amendment,2019 (Q518)	Are you informed of the tax changes introduced by the 2019 management finance law ?	1 = Yes 2 = No
Taxes owed knowledge (Q519)	Do you know all the taxes you are subject to ?	1 = Yes 2 = No
Geographical location (Q21)	According to the administrative division of the country.	1 = Maritime 2 = Plateaux 3 = Centrale 4 = Kara 5 = Savanes
Tax beneficiaries (Q524)	Do you think that the taxes paid serve more :	1 = Whole Togolese nation 2 = Public authorities
Severity of penalties (Q544)	In your opinion, with the advent of the OTR, is the tax administration more intransigent when fraudulent behavior is discovered ?	1 = Yes 2 = No
Tax burden (Q547)	How much of your income is from the taxes you personally paid for 2018 ?	1 = Less de 5% 2 = Enter 5 and 10% 3 = Enter 10 and 25% 4 = Ente 25 and 50% 5 = More 50%
Tax amount appreciation (Q548)	What is your impression of the amount of taxes you pay in Togo ?	1 = Largely supportable 2 = Acceptable 3 = Too high
VAT legitimacy (Q551-N)	Do you think it is legitimate to impose the following taxes on taxpayers in Togo ?	1 = Yes 2 = No
Costoms duties legitimacy (Q551-O)	Do you think it is legitimate to impose the following taxes on taxpayers in Togo ?	1 = Yes 2 = No



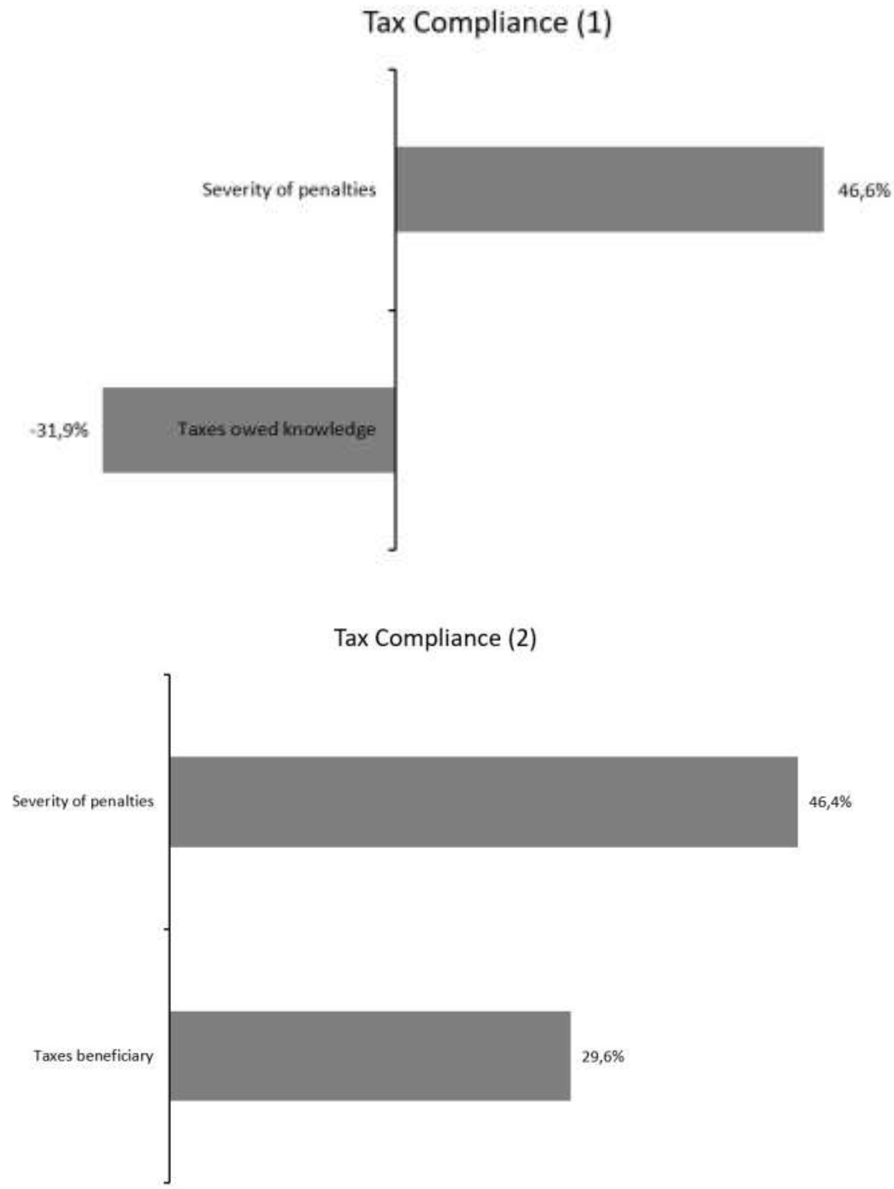
Appendix Figure 1. Determinants of business tax compliance (baseline model).



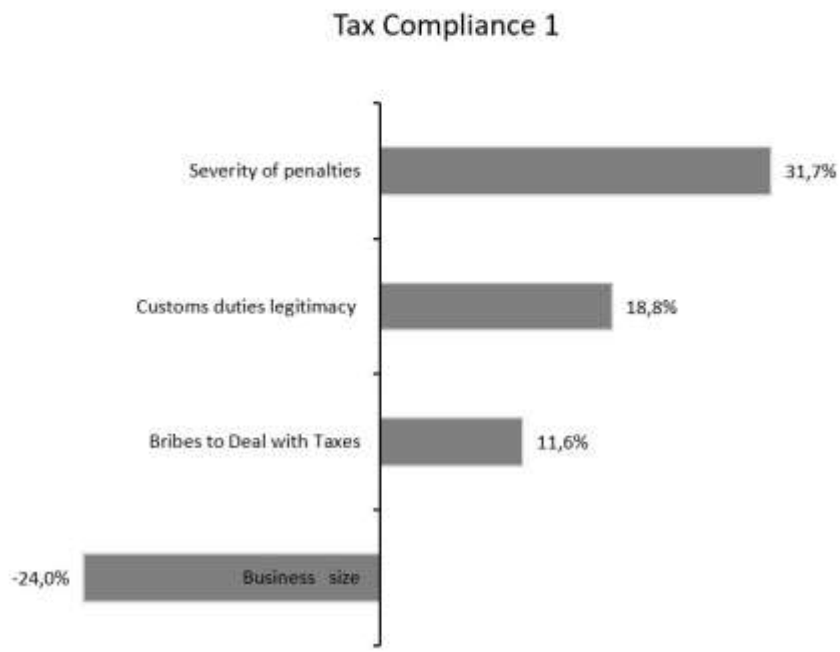
Appendix Figure 2. Determinants of business tax compliance by business size (small).



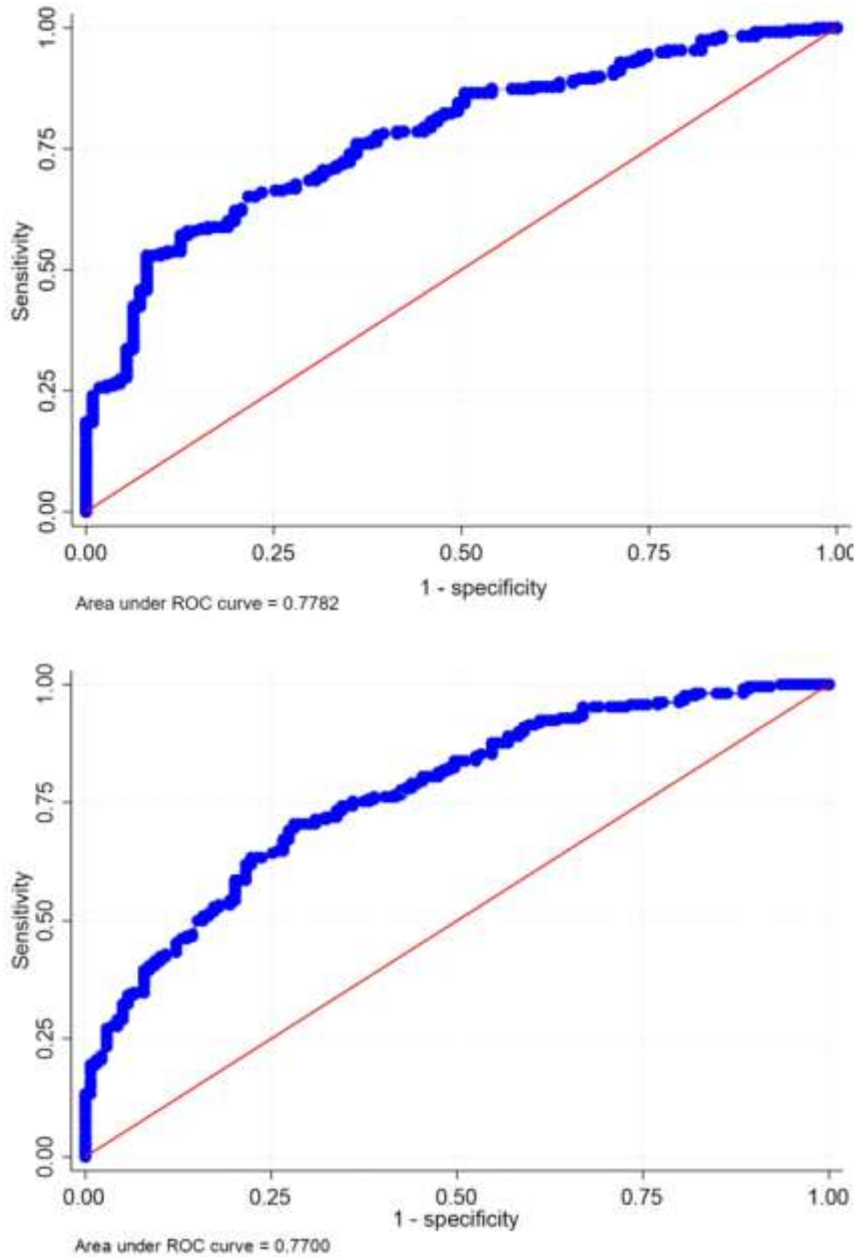
Appendix Figure 3. Determinants of business tax compliance by business size (medium).



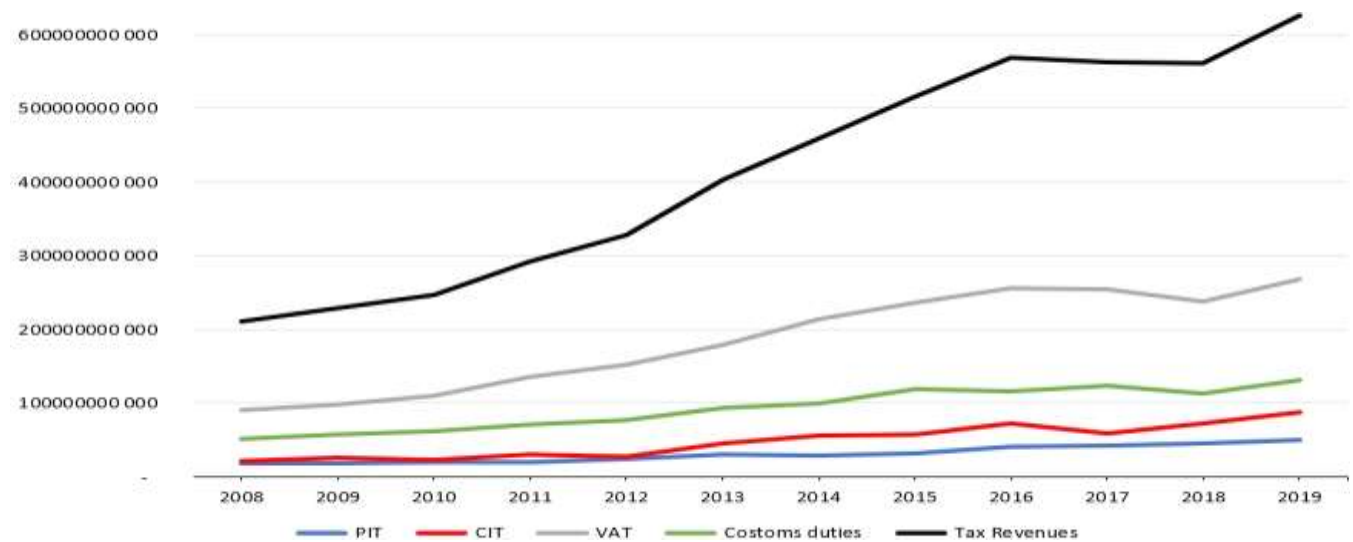
Appendix Figure 4. Determinants of business tax compliance by business size (large).



Appendix Figure 5. Determinants of business tax compliance by region (maritime).



Appendix Figure 6. Area under ROC curve.



Appendix Figure 7. Evolution of tax revenues in Togo (2008-2019).