

# Determinants of the Tax Compliance and Fairness Perceptions of Taxpayers on the online Tax System. A Case of Ghana

Crentsil Kofi Agyekum<sup>1</sup>, Isaac Arkoh<sup>1\*</sup>, Safia Ibrahim<sup>1</sup> and Hamdia B.Hudu<sup>1</sup>

<sup>1</sup>CSIR-Forestry Research Institute of Ghana, Ghana.

\*Corresponding Author

Isaac Arkoh, CSIR-Forestry Research Institute of Ghana, Kumasi, Ghana.

Submitted: 2023, Aug 01; Accepted: 2023, Aug 21; Published: 2023, Oct 23

**Citation:** Agyekum, C. K., Arkoh, I., Ibrahim, S., Hudu, H. B., (2023). Determinants of the Tax Compliance and Fairness Perceptions of Taxpayers on the online Tax System. A Case of Ghana. *J Huma Soci Scie*, 6(10), 327-337.

## Abstract

*In the face of the growing digital economy of Ghana, the Ghana revenue authority as part of its goal to increase domestic revenue mobilization has introduced an online tax system. The objective of the study is to determine the determinants of taxpayers' perception of the fairness of the tax system and the determinants of their tax compliance. Data were collected using questionnaires from 380 respondents and analyzed using Microsoft Excel and Stata version 14. Results showed that there is a negative relationship between tax compliance and tax complexity. Educational level and income levels have a positive relationship with tax compliance. The people of Winneba generally have a poor perception of the fairness of the tax structure. Tax knowledge, compliance cost, and tax usage were significant determinants of the fairness perception of the people of Winneba. In this regard, the study recommends that policymakers should direct policy drafting to ease the resource cost the tax structure poses on the taxpayers, intensify tax education, and also further simplify the tax complexity.*

**Keywords** Tax, Tax Compliance, Fairness, Online Tax System, Perception.

## Statements and Declarations

**Conflict of Interests** The authors do not share any form of competing interest both financially and otherwise, that tends to influence the result presented in this paper.

## JEL Classification Code

E00 Macroeconomics and Monetary Economics: General

E42 Monetary Systems; Standards; Regimes; Government and the Monetary System; Payment Systems

H26 Tax Evasion and Avoidance

## 1. Introduction

Since the early 1990s, tax reforms have been the fulcrum for broader economic reforms in developing countries [1]. The main objectives of all governments over this period have been to increase public revenues by enlarging the tax base; improving tax mobilization techniques; introducing consumption-based taxes such as Value Added Tax (VAT); and attempting to elevate the equities of tax administration by improving transparency and reducing corruption and tax evasion. Nothing seems to have changed as governments today are under increasing pressure to improve the delivery of public services in cost-effective ways. To meet this challenge for example tax authorities are turning to e-government-led solutions like electronic tax filing (e-filing) [2].

There are several methods employed today by tax agencies to capture tax returns and payment data electronically. The Ghana revenue authority in its quest to improve voluntary domestic

tax compliance and mobilization, especially in light of the GDP rebasing that shrank the tax-to-GDP ratio to around 13% from a previous ratio of 16.6%, digitalized the core processes of Domestic Tax Revenue Divisions as part of the Cashless Policy (GRA, 2021). This effort brought about the deployment of the taxpayers' portal which enables taxpayers to file returns in the comfort of their offices and homes. Not only did this bring about improvement in the tax mobilization capacity of the GRA, but also brought transparency and efficiency into the tax administration. Between 2017 and 2022, tax growth followed a trend between 20% to 40% (GRA, 2021), however despite this improvement, the domestic tax mobilization capacity of Ghana is still low and not able to account for a majority of the revenue contribution the country needs for its budgetary implementation (it only account for between 25 and 35% of total budgetary expenditures) and therefore heavily relies on external bodies and donor countries.

This however is not surprising as the tax-to-GDP for various economies especially developing countries are lower compared to the economies of advanced countries. Tax-to-GDP in low-income countries on average has been halfway below that of high-income countries over the last three decades [3]. The case of Ghana tends to be no different with an average tax to GDP of 13.5% in 2018 (OECD, 2021). The far below tax to-GDP rates of Ghana tend to be from the structural deficiencies in its tax administration process; excessive tax compliance costs; long processes; bribes and corruption.

Over the years studies on taxation have been mounting and a careful examination of the literature reveals four distinct but interrelated research activities. First are the research efforts relating to taxation in general [4-8]. The second relates to studies examining taxation reforms while the third research area relates to tax compliance and evasion [9-13]. Finally, the fourth relates to studies advancing the modernization of taxation processes in Ghana [14]. The literature search showed that more work has been done in Ghana along the first, second, and third research activities identified earlier. For instance, studied the tax culture of Ghanaians and refuted the assertion that Ghanaians in general are tax averse. His studies focused on taxation in general with an emphasis on the tax culture of Ghanaians categorically putting his work in the first strand. Other studies include the works of an example of research works in Ghana that can be placed in the second strand, while the work of fits in the third strand. As much has been done in the first three strands, little scholarly attention has been devoted to the modernization of taxation processes in Ghana. This research seeks to contribute to filling the gap by empirically examining the determinants of tax compliance on the online tax system and the optimality perception of the tax structure.

## 2. Tax system

Numerous studies have focused on improving domestic tax mobilization in Ghana however, limited attention has been given to these processes in the digital context. This section presents a review of the relevant available literature on tax compliance and the optimality of tax structures or systems.

Most studies in the world have researched the determinants of tax compliance using various frameworks and methodologies. As some of these frameworks and methodologies are credited for their robustness and detailedness others are exploratory and limiting making their reliability and validity questionable. For instance, used a qualitative approach to reveal taxpayers' perceptions of their knowledge and complexity of the income tax system in New Zealand. Despite the relevance of the work of to literature contribution in the region, the significance of the findings to influence tax compliance was not adequately examined as the work failed to employ any quantitative analysis to measure the direction of influence and statistical significance of the findings. Other studies have used the slippery slope framework to examine trust and power as determinants of tax compliance however, the institutional and moral differences between the study areas to

that of this study area limit the generalization of the findings of these studies to the current study [15]. Nevertheless, studies that employed the slippery slope framework discovered that where tax compliance is based on trust leads to voluntary tax compliance, but if tax compliance is based on power, it results in non-voluntary compliance which is referred to as enforced compliance [16-17].

## 3. Methods of Data Collection

The study examines the determinants of tax compliance on the digital tax platform and the tax fairness perception of taxpayers in Ghana at the district level. For the present work, tax compliance is empirically studied by examining the effect of tax complexity, educational level, and income level on tax compliance. The study did not limit the description of tax complexity to a specific aspect identified by other studies (computational complexity, forms complexity, compliance complexity, rule complexity, procedural complexity, low level of readability, tax law complexity) but the researcher sought taxpayers' views on their experience in dealing with the online tax system. The study further empirically examined the effect of tax knowledge, tax compliance cost, and tax usage on the tax fairness perception of taxpayers. The tax compliance cost to the taxpayer is measured in terms of financial cost and time while the tax usage is measured by the benefits taxpayers gain from the government. These variables as used in the analysis are a measure of optimal tax from the theory and literature.

The study was conducted in Winneba, the capital of the Efutu municipal district in the central region of Ghana. The town lies along the Gulf of Guinea stretching from coastal areas to non-coastal areas, 140 kilometers east of Cape Coast. Winneba lies on Latitude 5.33° N and longitude -0.62° W.

Data for the study was obtained principally from primary sources. The study data are from a sample of the people in Winneba chosen to be geographically and socioeconomically representative of the entire town. The data was collected using questionnaires and interviews. The sampling technique adopted was simple random sampling. The sample size was calculated using the Yamane formula

$$\text{Sample Size (n)} = N * [Z^2 * p * (1-p)/e^2] / [N - 1 + (Z^2 * p * (1-p)/e^2)]$$

Where,

- N = Population size
- Z = Critical value of the normal distribution at the required confidence level,
- P = Sample proportion,
- E = Margin of error

A sample of 380 people was chosen from a Population size (people between the age of 15 to 60) of 28286 (PHC, 2010), however with an expected response rate of 80%, 600 people were invited to participate in the survey. The researcher used a Critical value of 95% confidence level, with a Z score of 1.96, and an assumed margin of error of 5% or 0.05. The questionnaires were distributed

to the invited people through a face-to-face delivery.

### 3.1 Data Analysis and Model Specification

The empirical analysis is based on data from a survey conducted to solicit information from taxpayers between the ages of 15 and 60 years in Winneba. The descriptive statistics and regression analysis was performed using STATA version 14 and Microsoft Excel model for analysis of the data consisting of two ordered probit regression specification models. The models were used as the dependent variable had more than two outcomes and had a sequential ordering.

The first equation is the variables that affect the tax compliance decision of the taxpayer. Tax compliance is treated as the dependent variable in the first model with independent variables being tax complexity, ownership of bank or mobile money account, education level, and income.

$$Y = \alpha + \beta tfc + \beta el + \beta in + ei$$

Y is tax compliance,  $\alpha$  is the constant of regression,  $\beta$  is parameters and coefficient of regression,  $tfc$  is tax filing complexity,  $el$  is educational level,  $in$  is income level and  $ei$  is the disturbance term. The second model measures the optimality perception with the explanatory variables being compliance cost to the taxpayer, tax knowledge, and tax usage.

$$Y = \alpha + \beta tcc + \beta tkn + \beta tr + ei$$

Y is the tax optimality perception,  $\alpha$  is the constant of regression,  $\beta$  is the parameters,  $tcc$  is the tax compliance cost,  $tkn$  is the taxpayer's knowledge,  $tr$  is tax usage and  $ei$  is the disturbance term.

### 3.2 Measurement of Variables

Tax complexity is a categorical variable measured on a Likert scale of 1 as fully disagree, 2 as disagree, 3 as unsure, 4 as agreed, and 5 as fully agree. Ownership of a bank or mobile money account is a dummy variable with 1 as yes and 2 as no. educational level and income level are categorically measured. This is shown in Table 1.

Variable	Measurement	Expected sign
Tax complexity	Fully disagree=1 disagree=2 unsure=3 agree=4 fully agree	-
Ownership of bank/mobile money account	Yes=1 no=2	+
Educational level	Primary/O level=1 JHS=2 SHS=3 Bachelor's degree=4 others (masters/ PhD)=5	+
Income level	Below 1000 cedis/month=1 Between (1000 – 3000) cedis/month=2 Above 3000cedis/month=3	+
Tax compliance cost	Fully disagree=1 disagree=2 unsure=3 agree=4 fully agree	-
Tax Knowledge	Fully disagree=1 disagree=2 unsure=3 agree=4 fully agree	+
Tax usage	Fully disagree=1 disagree=2 unsure=3 agree=4 fully agree	+

**Table 1: Measurement and expected signs of variables**

## 4. Result and Discussion

A total of 380 respondents were included in the study in Winneba with 56.48% of the respondents being males and 43.16 of the respondents being females. The percentage of males that participated in the study outnumbered the females as more males were willing to give out the data required. This imbalance in the gender distribution indicates the proactiveness of males in the study area on the topic.

The ages of respondents involved in the study were from 18 years to 60 years. This age bracket was chosen as they were the more economically active age group. The average age of the respondents in the study falls between (26-39) years. The ages of respondents

were further grouped into three categories. The first ranged from 18 years to 25 years, followed by 26 years to 39 years, and lastly 40 years to 60 years. The age bracket (18-25) years constituted 19.47% of the total sample size, (26-39) years represented 39.74% of the total sample size, and the third age bracket (40-60) years made up 40.79% of the total respondents. This distribution is in line with the age distribution pointed out in the study of [18].

Most of the respondents in the study had higher educational qualifications, with a few having as low as primary education. The majority of respondents had a bachelor's degree, that is, 57.63% of the total respondent. 3.16% had primary education as their highest educational qualification. This is shown in Table 2.

Gender of respondents	Male	56.84 percent
	Female	43.16 percent
Age of respondents	(18-25) years	19.47 percent
	(26-39) years	39.74 percent
	(40-60) years	40.79 percent
Highest educational level	Primary/ O level	3.16 percent
	JHS	1.05 percent
	SHS	24.74 percent
	Bachelor degree	57.63 percent
	Others (masters/Ph.D.)	13.42 percent
Employment status	government employee	33.42 percent
	private sector employee	31.48 percent
	self-employed	19.74 percent
	Unemployed	15.00 percent
Total		100 percent
Source: Survey (2022)		

**Table 2: Social characteristics of survey respondents**

#### 4.1 Income Level of Respondents

The income levels of respondents were measured on monthly basis and categorized into three groups. The first range was income levels less than 1000 cedis per month, the second being between 1000 cedis and 3000 cedis per month, and the last being above 3000 cedis per month. 176 of the total respondents earned less than 1000 Ghana cedis per month, 129 respondents earned between 1000 cedis and 3000 cedis per month while the rest of the respondents

which is 75 representing 19.75% of the total respondents earned above 3000 cedis per month. The average income of respondents falls within the income bracket of lesser than 1000 cedis per month.

Among the 380 respondents, 367 (96.58%) owned a bank or mobile money account while only 13 (3.42%) didn't have an account. This was used to assess their ability to carry out cashless transactions. This is shown in Table 3.

Respondents' Income/month	Lesser than 1000	46.32 percent
	Between 1000 and 3000	33.95 percent
	Above 3000	19.75 percent
ownership of a bank or mobile money account	Yes	96.58 percent
	No	3.42 percent
Total		100 percent
Source: Survey (2022)		

**Table 3: Income levels of respondents**

#### 4.2 Knowledge and Awareness of the Online Tax System

This section looks at respondents' knowledge and awareness of the online tax system. To define respondents' knowledge of the online tax system, they were first asked whether they pay their taxes and further asked if they used the online tax system. Respondents were asked how they use online tax systems tools such as the tax calendar and tax calculator.

Knowledge of the tax system is an important variable for voluntary compliance in every tax system, especially in calculating an exact tax liability [19-20]. More current research undertaken in Malaysia also suggested tax knowledge to be the most essential factor to estimate taxpayers' compliance behavior under the online tax system [21-23]. This is empirically stated by other studies which include the works of which concludes that having tax knowledge

would result in higher compliance rates [24-25]. To assess their knowledge of the online tax system, respondents were asked about their knowledge of navigating the online tax system and their usage of online tax tools.

From the result of the survey, it was obvious that local dwellers in Winneba are aware of the online tax system as a majority disagreed with the lack of knowledge as the cause of them not using the online tax system tools. Despite 11.84% not being sure of their knowledge of the online tax system tools being a determinant of their usage of the tools, a minority of the respondents agreed to not using the online tax system tools due to their lack of knowledge despite their knowledge of its existence. The knowledge of a majority of the respondents included how to navigate the online tax system. This is shown in Table 4.

	Respondents have little Knowledge about navigating the online tax system						
		Fully disagree	Disagree	Unsure	Agree	Fully agree	Total
Respondents not using the online tax system because they lack knowledge of the online tax system tools	Fully disagree	28 (6.58)	31 (8.16)	2 (0.53)	0 (0.00)	0 (0.00)	58 (15.26)
	Disagree	8 (2.11)	26 (6.84)	28 (7.37)	36 (9.47)	33 (8.68)	131 (34.47)
	Unsure	0 (0.00)	18 (4.74)	17 (4.47)	10 (2.63)	0 (0.00)	45 (11.84)
	Agree	0 (0.00)	55 (14.47)	17 (4.47)	32 (8.42)	10 (2.63)	114 (30.00)
	Fully agree	1 (2.89)	0 (0.00)	4 (1.05)	0 (0.00)	17 (4.47)	32 (8.42)
	Total	44 11.58	130 34.21	68 17.89	78 20.53	60 15.79	380 100.00
Source: Survey (2022)							

**Table 4: Knowledge of the online tax system and navigation of the filing and payment system**

#### 4.3 Level and Description of the Usage of the Online Tax System Tools

Since respondents were positive about their knowledge of the online tax system tools and navigating the system, they were asked about their usage of the individual online tax systems tools such as the tax calendar, tax calculator, and the filing and payment tool. In Adams Smith's Wealth of Nations, on the criteria for an optimal tax system, that is payable at times and in ways convenient to the taxpayers and cheap to administer and collect, respondents had the option to choose whether they fully disagree, disagree, unsure, agree or fully agree to use the online tax system tools.

The use of the online tax system calculator was uncertain among a majority of the respondents, however, 33.21% of the respondents agreed to use the online tax system calculator while 30% of

respondents disagreed with using the online tax system calculator. For the online tax system calendar, on the extreme 9.74% of the respondents fully disagreed with using the online tax system calendar and 3.68% of the respondents fully agreed to use the online tax system calendar. Despite 136 respondents representing 35.79% of the respondent were not sure of the use of the online tax system calendar, 21.84% of the respondents agreed to use the online tax system calendar to know when they are to pay their tax obligation while 28.95% of the respondents disagreed to using the online tax system calendar.

The majority of the respondents (52.63%) do not use the online tax system filing and payment tool to pay their taxes, that is, most of the respondents resort to other means of paying their taxes or better still practice non-compliance.

Tax calculator	Fully disagree	4.21 percent
	Disagree	25.79 percent
	Unsure	35.79 percent
	Agree	31.05 percent
	Fully agree	3.16 percent
Tax calendar	Fully disagree	9.47 percent
	Disagree	28.95 percent
	Unsure	35.79 percent
	Agree	21.84 percent
	Fully agree	3.68 percent
Tax filing and payment	Fully disagree	10.79 percent
	Disagree	41.84 percent
	Unsure	25.26 percent
	Agree	19.21 percent
	Fully agree	2.89 percent
Total		100 percent
Source: Survey (2022)		

**Table 5: Usage of the online tax system tools**

#### 4.4 Online Tax System Filing Complexity Perception

In his research on 45 countries, found that complexity is the most important determinant of noncompliance, apart from education, income source, fairness, and tax morale [26-27]. The findings of documented that procedural tax complexity contributes to an increase in tax noncompliance [28]. In consistence with the

literature and respondents having demonstrated some knowledge of the online tax system, respondents were asked how complex they perceive the online tax system. Out of the 380 respondents, the majority representing 44.47% of the respondents were in consonance agreed to file taxes on the online tax system is too complex.

<b>The online tax system is too complex</b>	Fully disagree	<b>13.68</b>
	Disagree	22.63
	Unsure	19.21
	Agree	41.84
	Fully agree	2.63
<b>Total</b>		100
Source: Survey (2022)		

**Table 6: online tax system complexity perception of respondents**

#### 4.5 Online Tax System and Compliance Cost to the Taxpayer

A tax system usually involves a cost of collection to the authorities and a compliance cost to the taxpayers. The cost to taxpayers is usually ignored; When a tax is imposed, it affects the total resource base of a taxpayer leading to a re-allocation of his resources to honor the payment of tax. The time, manner, and method of payment exert a resource allocation cost as far as the taxpayer is

concerned. To estimate the compliance cost to taxpayers in this study, the cost was grouped under financial cost and time spent. Respondents were asked about the time they spend filing and paying taxes on the online tax system and the financial cost it possesses on them. As represented in Table 7, filing taxes on the online tax system did not pose both financial and time costs for the majority of the respondents.

	<b>Respondents spend much time filing and paying taxes on the online tax system</b>						
		<b>Fully disagree</b>	<b>Disagree</b>	<b>Unsure</b>	<b>Agree</b>	<b>Fully agree</b>	<b>Total</b>
<b>Cost respondents financially to file and pay taxes on the online tax system</b>	Fully disagree	21 (5.53)	9 (2.37)	3 (0.79)	0 (0.00)	0 (0.00)	33 (8.68)
	Disagree	12 (3.16)	41 (10.79)	19 (5.00)	6 (1.58)	4 (1.05)	82 (21.58)
	Unsure	0 (0.00)	55 (14.47)	113 (29.74)	0 (0.00)	0 (0.00)	168 (44.21)
	Agree	0 (0.00)	24 (6.32)	28 (7.37)	33 (8.68)	0 (0.00)	85 (22.37)
	Fully agree	2 (0.53)	0 (0.00)	0 (0.00)	2 (0.53)	8 (2.11)	12 (3.16)
	<b>Total</b>	35 (9.25)	129 (33.95)	163 (42.89)	41 (10.79)	41 (10.79)	380 (100)

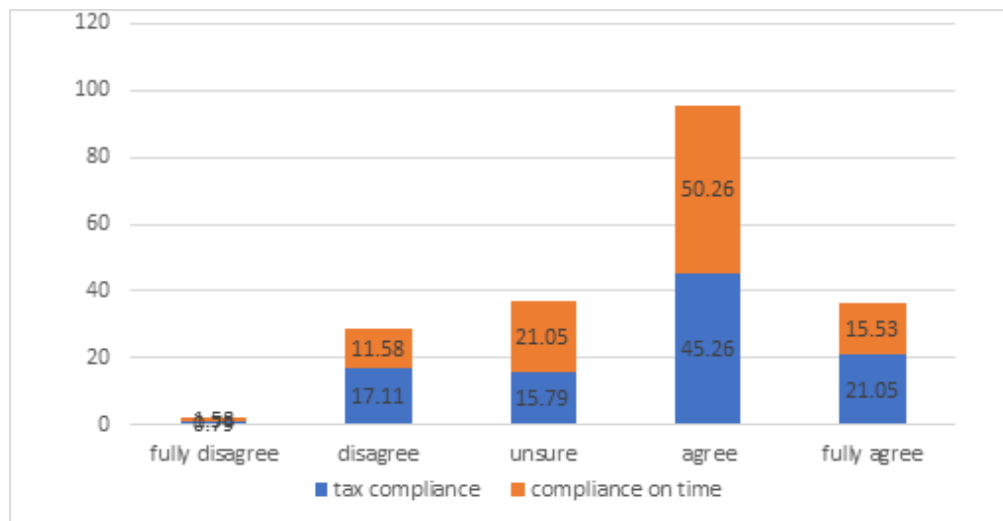
**Table 7: compliance cost to taxpayers**

#### 4.6 Compliance Decision of Respondents

In the study, respondents were asked questions on their tax commitment to assess their compliance with their tax obligation. After analyzing the data gathered from respondents, the findings showed that out of the 380 respondents that were interviewed

for the study, a vast majority represented by 67.31% of the total respondents agreed to pay their tax obligation. The study further investigated to know if respondents fulfilled their tax obligations on time as untimely tax is considered not a return [29]. This is represented in Figure 1.





Source: Survey (2022)

**Figure 1:** Respondent's tax compliance and timely compliance

#### 4.7 Determinants of Tax Compliance

Table 8 presents the results of the marginal effect of the estimated ordered probit model on the determinants of the tax compliance decision of respondents. A Pseudo  $R^2$  of at least 0.1526 reported suggest about 15% of the variations are being explained by the model and the statistical significance of the LR  $\chi^2$  underscores the joint significance of the explanatory variables in determining tax compliance in Winneba and robustness of the estimated results. The result of the analysis demonstrates that if the tax complexity is high, respondents' tax compliance decision generally decreases by 0.185. Education and income had a positive relationship with the tax compliance decision of respondents.

Based on the estimation of the model if tax complexity increases by 1 unit, 0.12% of respondents are likely to fully disagree with paying their taxes, 3.3% of respondents are likely to disagree with paying their taxes, about 3% of respondents are likely to be unsure of paying their tax, 2% of respondents are less likely to agree to pay their tax and 4% are less likely to fully agree with paying their tax. This is consistency with the findings of who concluded their studies with a negative relationship between tax complexity and tax compliance despite the study by Saw and Sawyer (2010) focused on the complexity of tax law [30]. The result is also supported by the findings of which concluded an inverse relationship between compliance and the level of complexity of the tax system [31].

Based on the estimation, the study uncovered that if respondents' educational status changes by a unit, 0.25% of the respondents

are less likely to fully disagree with paying their taxes, 7% of the respondents are less likely to disagree with paying their tax, 6% of the respondents are less likely to be unsure of paying their taxes, 4% of the respondents are likely to agree to pay their taxes and about 9% of the respondents are likely to fully agree to pay their taxes. This finding is supported by who concluded a positive relationship between the educational level of taxpayers and their level of tax compliance [32-33].

The estimation results also found that if the income levels of respondents increase by 1%, 0.34% of the respondents are less likely to fully disagree with paying their taxes, 9% of the respondents are less likely to disagree with paying their taxes, 7% of the respondents are less likely to be unsure of paying their tax, 5% of the respondents are likely to agree to pay their taxes and about 12% of the respondents are likely to pay their taxes. This finding aligns with the findings of who discovered a positive correlation between income level and compliance rate [34].

Based on the estimation of the model as seen in Table 8, there is a probability that 1% of the respondents are likely to fully disagree with complying with their tax obligation, 16% of the respondents are likely to disagree with complying with their tax obligation, 15% of the respondents are likely unsure to comply with their tax obligation, 47% of the respondents are likely to agree to comply with their tax obligation and 21% of the respondents are likely to fully agree to comply with their tax obligation.

	Outcome 1		Outcome 2		Outcome 3		Outcome 4		Outcome 5	
Independent variables	dy/dx	z stat	dy/dx	z stat	dy/dx	z stat	dy/dx	z stat	dy/dx	z stat
Tax complexity	.001 (.001)	1.40	.034 (.01)	3.25	.027 (.009)	3.12	-.02 (.001)	-2.56	-.04 (.01)	-3.28
Education level	-.003 (.002)	-1.58	-.07 (.02)	-3.92	-.06 (.02)	-3.68	.04 (.01)	2.78	.09 (.02)	4.11
Income level	-.0034 (.003)	-1.50	-.09 (.02)	-5.29	-0.07 (.02)	-4.64	0.05 (.02)	3.22	.12 (.02)	5.39
Pseudo R2	.1526		.1526		.1526		.1526		.1526	
LR Chi2	152.93		152.93		152.93		152.93		152.93	
No. Of observation	380		380		380		380		380	
Outcome probabilities	1%		16%		15%		47%		21%	

**Table 8: Marginal effect of the determinants of tax compliance decision of respondents**

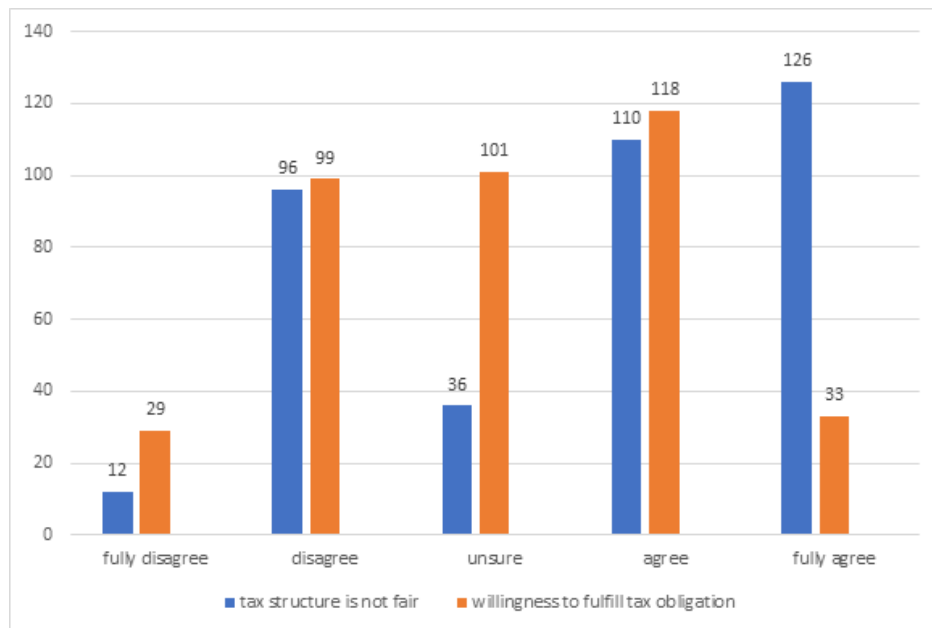
**Note:** Outcome 1= respondent fully disagrees with complying with their tax obligation; Outcome 2= respondents disagree with complying with their tax obligation; Outcome 3= respondents unsure about complying with their tax obligation Source; Outcome 4= respondents fully agree to comply with their tax obligation; Outcome 5= respondents agreeing to comply to their tax obligation. figures in brackets are the standard errors. survey (2022).

#### 4.8 Tax Optimality Perception of Respondents

From the study, respondents were asked questions on their perception of tax fairness to assess their view on the optimality of the tax structure. After analyzing the data gathered from

respondents, the findings showed that out of the 380 respondents that were interviewed, the majority representing 62.11% of the total respondents agreed to the tax structure not being fair.

The study further investigated to know the influence of the online tax system on the respondents' willingness to always pay their taxes, 39.73% of the respondents agreed to want to always pay their taxes due to the online tax system while 33.68% of the respondents disagreed with this. 107 respondents representing 26.58% however were not certain as to whether the filing of taxes on the online tax system motivates them to always pay their taxes. This data is represented in Figure 2.



Source: Survey (2022)

**Figure 2: Tax optimality perception and willingness to fulfill tax obligation**



To assess what determines the tax structure as being fair in the view of the respondents, an ordered probit regression was used to analyze the marginal effects of the determinants of their tax

optimality perception and the probabilities of their perception. The result of the estimation is presented in Table 9.

	Outcome 1		Outcome 2		Outcome 3		Outcome 4		Outcome 5	
Independent variables	dy/dx	z stat	dy/dx	z stat	dy/dx	z stat	dy/dx	z stat	dy/dx	z stat
Compliance cost	.011 (.004)	2.73	.08 (.018)	4.43	.02 (.005)	3.28	-.01 (.006)	-.99	-.10 (.023)	-4.47
Tax knowledge	-.005 (.002)	-2.23	-.04 (.013)	-2.65	-.008 (.003)	-2.41	.003 (.003)	.94	.045 (.017)	2.72
Tax usage	-.02 (.006)	-3.33	-.14 (.016)	-8.55	-.03 (.011)	-4.53	.011 (.011)	1.01	.180 (.019)	9.52
Pseudo R <sup>2</sup>	.1190		.1190		.1190		.1190		.1190	
LR Chi <sup>2</sup>	127.10		127.10		127.10		127.10		127.10	
No. Of observation	380		380		380		380		380	
Outcome probabilities	0.04		0.24		0.09		0.30		0.33	

**Table 9: marginal effect of the determinants of the tax optimality perception of respondents**

Note: Outcome 1= respondent fully disagrees with the tax structure not being fair; Outcome 2= respondents disagree with the tax structure not being fair; Outcome 3= respondents are unsure of the tax structure not being fair; Outcome 4= respondents fully agree with the tax structure not being fair; Outcome 5= respondents agreeing to the tax structure not being fair. figures in brackets are the standard errors. Source: analysis of survey data (2022)

The Pseudo R<sup>2</sup> is 0.1190 which means that about 12% of the variation in the tax optimality perception is explained by the tax knowledge of respondents, compliance cost to respondents, and tax usage with the LR Chi<sup>2</sup> of 127.10

Based on the result, at a 95% confidence level, the marginal effect of a percentage increase in respondents' compliance cost of fulfilling their tax obligation results in 1% of respondents likely to fully disagree with the tax structure generally not being fair, 8% of respondents are likely to disagree to the tax structure generally not being fair, 2% of respondents are likely to be unsure of the general tax structure not to be fair, 0.6% of respondents are less likely to agree to the tax structure generally not being fair and 10% of respondents are less likely to fully agree to the tax structure generally not being fair. That is, there exists a negative relationship between compliance cost and the fairness perception of taxpayers. This result is supported by who reported a significant negative relationship between compliance level and compliance cost [35-36].

Based on the result, at a 5% significance level, the marginal effect of a percentage increase in respondents' tax knowledge results in 0.49% of respondents being less likely to fully disagree with the tax structure generally not being fair, 4% of respondents being less likely to disagree to the tax structure generally not being fair, 0.77% of respondents are less likely to be unsure of the general tax structure not to be fair, 0.27% of respondents are likely to agree to the tax structure generally not being fair and 5% are likely to fully agree to the tax structure generally not being fair. There is a

positive and significant relationship between fairness perception and tax knowledge, consequently, tax knowledge can positively influence tax compliance. This is in line with previous studies by who also reported a positive relationship between tax knowledge and tax compliance [37].

Based on the result, at a 95% confidence level, the marginal effect of a percentage increase in the tax usage results in 2% of respondents being less likely to fully disagree with the tax structure generally not being fair, 14% of respondents are less likely to disagree to the tax structure not generally being fair, 3% of respondents are less likely to be unsure of the general tax structure not to be fair, 1% of respondents are likely to agree to the tax structure generally not being fair and 18% of respondents are likely to fully agree to the tax structure generally not being fair.

Based on the estimation of the ordered probit model, there is the probability that 4% of the respondents are likely to fully disagree with the tax structure not being optimal, 24% are likely to disagree with the tax structure not being optimal, 9% are likely to be unsure of the tax structure is optimal, 30% are likely to agree to the tax structure not being optimal and 33% are likely to fully agree to the tax structure not being optimal.

## Conclusion

According to probit regression results (table 8 and 9) tax complexity, income level, educational level, compliance cost, tax knowledge, and tax usage were all significant determinants of tax compliance and the fairness perception of taxpayers. Tax complexity negatively correlates with tax compliance while educational level and income level exhibit a positive relationship with compliance level. Compliance cost had a negative relationship with the level of fairness perception of taxpayers while tax knowledge and tax usage positively related to taxpayers' fairness perception. The analysis of the results of the studies and hypothesis testing supports the hypothesis formulated by the current study since the P-value is less than the significance level (P<0.05). Therefore H1, H2, H3,

H4, H5, and H6 are statistically significant.

### Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

### Reference

1. Atuguba, R. (2021). Tax Culture: Perspectives from an African State. *American Journal of Trade and Policy*, 8(1), 25-58.
2. Wasao, D. (2014). The effect of online tax system on tax compliance among small taxpayers in east of Nairobi tax district (Doctoral dissertation, University of Nairobi).
3. McNabb, K., & LeMay-Boucher, P. (2014). Tax structures, economic growth and development.
4. Ohemeng, F. L., & Owusu, F. Y. (2015). Implementing a revenue authority model of tax administration in Ghana: An organizational learning perspective. *The American Review of Public Administration*, 45(3), 343-364.
5. Armah-Attoh, D., & Awal, M. (2013). Tax administration in Ghana: Perceived institutional challenges. *Afrobarometer Briefing Paper*, 124(1), 9.
6. Basu, S. (2010). Direct Taxation and E-Commerce: Possibility and Desirability. *International Journal of Innovation in the Digital Economy (IJIDE)*, 1(1), 37-63.
7. Ampong, E. (2015). Assessing the challenges of taxation revenue mobilization in Ghana and the way forward—a case study in Assin north municipal, Assin south district, Abura Asebu kwamankese district and Mfantseman municipal assembly in the central region of Ghana (doctoral dissertation, department of accounting, school of business management and administration, central university college).
8. Owusu-Gyimah, A. (2015). Tax revenue generation and the economic development of Ghana. *European Journal of Business and Management*, 7(14), 78-88.
9. Adeyiga, G. K. (2013). Baseline Study of Ghana's Tax System. Commissioned by Ghana Integrity Initiative (GII).
10. Matsumoto, T. (2018). Thai tax reforms from 1992 to 2013: the problems of tax systems in developing countries. *Japanese Journal of Political Science*, 19(3), 417-428.
11. Okpeyo, E. T., Musah, A., & Gakpetor, E. D. (2019). Determinants of tax compliance in Ghana. *Journal of Applied Accounting and Taxation*, 4(1), 1-14.
12. Saad, N. (2014). Tax knowledge, tax complexity, and tax compliance: Taxpayers' view. *Procedia-Social and Behavioral Sciences*, 109, 1069-1075.
13. Torgler, B. (2011). Tax morale and compliance: a review of evidence and case studies for Europe. *World Bank Policy Research Working Paper*, (5922).
14. Tetteh, J. E., Haizel-Commeh, J., & Otchere-Ankrah, B. (2022). Online Service Quality of State Organizations: A Study of Online Services of Ghana Revenue Authority. *Journal of Internet Commerce*, 1-29.
15. Gambo, E. M. J., Mas'ud, A., Nasidi, M., & Oyewole, O. S. (2014). Tax complexity and tax compliance in African self-assessment environment. *International Journal of Management Research and Reviews*, 4(5), 575.
16. Kogler, C., Batrancea, L., Nichita, A., Pantya, J., Belianin, A., & Kirchler, E. (2013). Trust and power as determinants of tax compliance: Testing the assumptions of the slippery slope framework in Austria, Hungary, Romania, and Russia. *Journal of Economic Psychology*, 34, 169-180.
17. Wahl, I., Kastlunger, B., & Kirchler, E. (2010). Trust in authorities and power to enforce tax compliance: An empirical analysis of the "slippery slope framework". *Law & Policy*, 32(4), 383-406.
18. Ameyaw, Y. "A sample survey of the population of some communities in the Winneba Metropolis in the central region of Ghana." *International Journal of Applied Environmental Sciences*, vol. 5, no. 4, Sept. 2010, pp. 651+. Gale Academic OneFile, [link.gale.com/apps/doc/A323258150/AONE?u=anon~a2a397c5&sid=googleScholar&xid=8af98e7a](https://link.gale.com/apps/doc/A323258150/AONE?u=anon~a2a397c5&sid=googleScholar&xid=8af98e7a). Accessed 16 Mar. 2023.
19. Palil, M. R. (2005). Taxpayers knowledge: A descriptive evidence on demographic factors in Malaysia. *Jurnal Akuntansi dan Keuangan*, 7(1), 11-21.
20. Mansor, M., Saad, N., & Ibrahim, I. (2004). The self-assessment system and its compliance costs. *National Accounting Research Journal*, 2(1), 1-16.
21. Loo, E. C. (2006). Tax knowledge, tax structure, and compliance: A report on a quasi-experiment. *New Zealand Journal of Taxation Law and Policy*, 12(2), 117 – 140.
22. Loo, E. C., McKerchar, M., & Hansford, A. (2008). Tax compliance behavior: Findings derived from a mixed method design. Paper presented at the 8th International Tax Administration Conference, Sydney
23. Loo, E. C., McKerchar, M., & Hansford, A. (2009). Understanding the compliance behavior of Malaysian individual taxpayers using a mixed method approach. *Journal of the Australasian Tax Teachers Association*, 4(1), 181 – 202.
24. Kasipillai, J., & Abdul Jabbar, H. (2003). Tax compliance attitude and behavior: Gender & ethnicity differences of Malaysian taxpayers.
25. Kirchler, E., Niemirowski, A., & Wearing, A. (2006). Shared subjective views, intent to cooperate and tax compliance: Similarities between Australian taxpayers and tax officers. *Journal of economic psychology*, 27(4), 502-517.
26. Richardson, G. (2006). Determinants of tax evasion: A cross-country investigation. *Journal of International Accounting, Auditing and Taxation*, 15(2), 150-169.
27. Richardson, G. (2006). The impact of tax fairness dimensions on tax compliance behavior in an Asian jurisdiction: The case of Hong Kong. *Int'l Tax J.*, 32, 29.
28. Cox, S. P., & Eger III, R. J. (2006). Procedural complexity of tax administration: The road fund case. *Journal of Public Budgeting, Accounting & Financial Management*.
29. White, D. A. (2015). When a tax return isn't a tax return: Dischargeability of late-filed taxes. *American Bankruptcy Institute Journal*, 34(3), 24.
30. Saw, K., & Sawyer, A. (2010). Complexity of New Zealand's income tax legislation: The final installment. *Austl. Tax F.*, 25,

31. Brainyyah, M. Q., & Rusydi, M. K. (2013). The effect of tax fairness, tax knowledge, and tax complexity on tax compliance: the case of some entrepreneurs' taxpayers in Malang. *Jurnal Ilmiah Mahasiswa FEB*, 1(2).
32. Adimassu, N. A., & Jerene, W. (2016). Determinants of voluntary tax compliance behavior in the self-assessment system: Evidence from SNNPRS, Ethiopia. *International Journal of Science and Research*, 5(12), 967-973.
33. Alasfour, F., Samy, M., & Bampton, R. (2016). The determinants of tax morale and tax compliance: Evidence from Jordan. In *Advances in taxation* (pp. 125-171). Emerald Group Publishing Limited.
34. Durham, Y., Manly, T. S., & Ritsema, C. (2014). The effects of income source, context, and income level on tax compliance decisions in a dynamic experiment. *Journal of Economic Psychology*, 40, 220-233.
35. Rantelangi, C., & Majid, N. (2017, October). Factors that influence the taxpayers' perception on the tax evasion. In *Mulawarman International Conference on Economics and Business (MICEB 2017)* (pp. 219-225). Atlantis Press.
36. Nzioki, P., & Peter, O. R. (2014). Analysis of factors affecting tax compliance in real estate sector: A case of real estate owners in Nakuru Town, Kenya. *Research Journal of Finance and Accounting*, 5(11), 1-12.
37. Mariziana (2013). The relationship between perceptions and level of compliance under self-assessment system- a study in the east coast region. *Journal of global business and economics*.
38. Alabede, J. O. (2012). An investigation of factors influencing taxpayers' compliance behaviour: Evidence from Nigeria (Doctoral dissertation, Universiti Utara Malaysia).
39. Azmi, A. A. C., Zainuddin, S., Mustapha, M. Z., & Nawi, Y. (2016). The mediating effect of tax fairness on the relationship between knowledge, complexity, and voluntary tax compliance. *Asian Journal of Accounting Perspectives*, 9(1), 1-12.
40. Campbell, D. F., & Hanschitz, G. (2018). Digitalization of tax: epistemic tax policy. In *Handbook of Cyber-Development, Cyber-Democracy, and Cyber-Defense* (pp. 87-98). Springer, Cham.
41. da Conceição Borrego, A. C. (2014). Tax compliance and tax complexity in Portugal: Essays on the perception of tax professionals (Doctoral dissertation, Universidade do Minho (Portugal)).
42. Eichfelder, S., & Vaillancourt, F. (2014). Tax compliance costs: A review of cost burdens and cost structures. Available at SSRN 2535664.
43. Emmert-Streib, F., & Dehmer, M. (2019). Understanding statistical hypothesis testing: The logic of statistical inference. *Machine Learning and Knowledge Extraction*, 1(3), 945-962.
44. Fjeldstad, O. H., Schulz-Herzenberg, C., & Hoem Sjursen, I. (2012). People's views of taxation in Africa: a review of research on determinants of tax compliance. Available at SSRN 2411424.
45. Kirchler, E., Kogler, C., & Muehlbacher, S. (2014). Cooperative tax compliance: From deterrence to deference. *Current Directions in Psychological Science*, 23(2), 87-92.
46. Manual, V., & Xin, A. Z. (2016). Impact of tax knowledge, tax compliance cost, tax deterrent tax measures towards tax compliance behavior: a survey on self-employed taxpayers in West Malaysia. *Electronic Journal of Business and Management*, 1(1), 56-70. [https://ejbm.sites.apiit.edu.my/files/2018/05/Paper6\\_Impact\\_of\\_Tax\\_Knowledge\\_Tax\\_Compliance\\_Cost.pdf](https://ejbm.sites.apiit.edu.my/files/2018/05/Paper6_Impact_of_Tax_Knowledge_Tax_Compliance_Cost.pdf)
47. Nasution, M. K., Santi, F., Husaini, H., Fadli, F., & Pirzada, K. (2020). Determinants of tax compliance: A study on individual taxpayers in Indonesia. *Entrepreneurship and Sustainability Issues*, 8(2), 1401. DOI:10.9770/jesi.2020.8.2(82)
48. Nicoleta, B. (2011). A review of factors for tax compliance. *Annals of "Dunarea de Jos"*, 17(1), 69-76.
49. OECD (2021), *Revenue Statistics in Africa 2021-Ghana*. Retrieved from [oe.cd/revenue-statistics-in-Africa](http://oe.cd/revenue-statistics-in-Africa).
50. Olbert, M., & Spengel, C. (2019). Taxation in the digital economy—Recent policy developments and the question of value creation. *ZEW-Centre for European Economic Research Discussion Paper*, (19-010). <https://ssrn.com/abstract=3368092>
51. Omondi, J. A., & Theuri, J. M. (2019). Effect of taxpayer awareness and compliance costs on tax compliance among small scale traders in Nakuru town, Kenya'. *International Academic Journal of Economics and Finance*, 3(3), 279-295.
52. Popkova, E. G., Zhuravleva, I. A., Abramov, S. A., Fetisova, O. V., & Popova, E. V. (2019). Digitization of taxes as a top-priority direction of optimizing the taxation system in modern Russia. *Optimization of the Taxation System: Preconditions, Tendencies and Perspectives*, 169-175. DOI: [https://doi.org/10.1007/978-3-030-01514-5\\_20](https://doi.org/10.1007/978-3-030-01514-5_20)
53. Sapiei, N. S., Kasipillai, J., & Eze, U. C. (2014). Determinants of tax compliance behavior of corporate taxpayers in Malaysia. *eJTR*, 12, 383. [https://www.researchgate.net/profile/Noor-Sharoja/publication/242564531\\_COMPLIANCE\\_COSTS\\_AND\\_COMPLIANCE\\_OF\\_CORPORATE\\_TAXPAYERS\\_IN\\_MALAYSIA/links/5b666e3ca6fdcc94a70ec271/COMPLIANCE-COSTS-AND-COMPLIANCE-OF-CORPORATE-TAXPAYERS-IN-MALAYSIA.pdf](https://www.researchgate.net/profile/Noor-Sharoja/publication/242564531_COMPLIANCE_COSTS_AND_COMPLIANCE_OF_CORPORATE_TAXPAYERS_IN_MALAYSIA/links/5b666e3ca6fdcc94a70ec271/COMPLIANCE-COSTS-AND-COMPLIANCE-OF-CORPORATE-TAXPAYERS-IN-MALAYSIA.pdf)
54. Schmolders, G. (1959). Fiscal psychology: A new branch of public finance. *National Tax Journal*, 12(4), 340-345.
55. Sebele-Mpofu, F. Y., & Chinoda, T. (2019). Tax knowledge, tax system complexity perceptions and attitudes of the commercial sugarcane farmers and their influence on tax compliance in the Lowveld Area, Zimbabwe. *International Journal of Innovative Science and Research Technology*, 4(4), 407-418.
56. Taing, H. B., & Chang, Y. (2021). Determinants of tax compliance intention: Focus on the theory of planned behavior. *International Journal of public administration*, 44(1), 62-73. <https://doi.org/10.1080/01900692.2020.1728313>

**Copyright:** ©2023 Isaac Arkoh, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.