Job performance, knowledge and perceived power of tax officers on tax morale amongst agrochemical traders in Ghana

Richmond Kumi and Richard Kwasi Bannor
*Department of Agribusiness Management and Consumer Studies,
University of Energy and Natural Resources, Sunyani, Ghana*

Abstract

Purpose – The paper aims to examine agrochemical traders' tax morale in three Ghanaian regions.

Design/methodology/approach – Primary data were collected from 92 respondents using structured questionnaires. A multistage sampling technique was employed and used in selecting respondents.. Descriptive statistics, factor analysis and quantile regression analysis were used to analyse data obtained via the questionnaires.

Findings – The study found tax reporting knowledge, tax calculating knowledge and tax payment knowledge to be the keen factors influencing agrochemical traders' tax knowledge. It was also revealed that age, religion and marriage positively influence the tax morale of traders. Inversely, gender, high level of education and monthly sales were found to affect tax morale negatively. Moreover, trust (respect, trustworthiness and expertise knowledge) negatively influenced tax morale. Authorities' tax knowledge and power (sanction and lockdown) were revealed to impact tax morale positively. However, tax morale decreases amongst agrochemical traders with higher tax morale when sanction increases.

Originality/value – Unlike previous studies which focussed on tax morale amongst individuals and firms outside the agribusiness sector, this study examined the tax morale within the informal agrochemical trading sector, which has recently attracted colossal patronage due to the high usage of agrochemicals amongst farmers in Africa and Ghana. This study also assumed tax morale to be at different levels; hence the factors that affect the morale at different levels differ. Therefore, the study examined the factors influencing tax morale amongst agrochemical traders by segregating tax morale into quartiles. Relating to theory, the economic deterrence theory was used to ground the study, which is not usually used in most tax morale studies.

Keywords Tax, Tax knowledge, Tax morale, Agrochemical traders

Paper type Research paper

1. Introduction
Economically, taxation is one dynamic tool for ensuring stability. Tax revenue ensures funding to the government for financing its expenditure towards economic growth, and effective and efficient provision of citizens' welfare (Yew, Milanov, & McGee, 2015; Armah-Attoh & Awal, 2013). However, the extent to which individuals are willing to pay tax contributions has caught the attention of many studies (Saad, 2014; Lee, 2017; Inasius, 2019a, b; Nagel, Huber, Van Praag, & Goslinga, 2019; Taing & Chang, 2021). According to Torgler, Schaffner and Macintyre (2007), the willingness to pay tax is best explained by tax morale.

Tax morale [1] is an innate motivation factor. Accordingly, these motivational factors are intrinsic, by which taxpayers obey tax rules and regulations and pay taxes. The role of tax morale in tax compliance is perceived to be very vital (Lago-Peñas & Lago-Peñas, 2010; Kogler *et al.*, 2013). For instance, tax morale increases as the motivation to evade taxes reduce (Torgler *et al.*, 2007). Tax compliance is better in advanced countries than in developing countries (Mas'ud, Aliyu, Gambo, Al-Qudah, & Al Sharari, 2014) due to the applicable taxation system in the former (Oladipo *et al.*, 2019). In like manner, Rodriguez-Justicia and Theilen (2018) argued that tax morale is higher amongst countries with fairer tax systems.

For a sound tax system and improved tax morale of the citizenry, the Ghanaian tax system has seen a series of reforms in times past. These reforms are usually backed by legislative enforcement, ranging from Supreme Military Council Decree 5 (SMCD 5) before 1975 and 2000, Value Added Tax (VAT) in 1995 and 1998 under Act 546 (Muazu, Musah, & Abdul-Hanan, 2015), PNDC Law 330 of 1993, Internal Revenue Act 2000 (Act 592) and Income Tax Act 2015 (Act 896). Despite these efforts to improve the tax system, it is challenging to encapsulate the informal sector into the tax net (Amamoo, 2020). As a result, there is still low tax compliance in the informal sector (Carroll, 2011). Terkper (2013) states that only 5% of the 1.5 million tax population (direct taxpayers) represent the informal sector. Meanwhile, the informal sectors in most developing countries like Ghana are dominated by agriculture (World Bank, 2017), a possible sector to increase government revenue (Hill & Blandford, 2007). Therefore, to encourage agricultural tax compliance, the Ghana Income Tax Act (2015) has made provisions (concessionary tax rate) for taxing agricultural produce, except for areas like agrochemical income tax which is treated under the business income tax rule of the same act (Act 896). Hence, agrochemical traders are expected to apply the normal income tax rate provided under the Income Tax Act (2015), which applies to business income.

In Ghana, the use of agrochemicals is high as a result of low fertile land and biological constraints (pest, weeds and diseases) in crop production (MOFA, 2003; Fianko, Donkor, Lowor, & Yeboah, 2011; Diarra & Tasie, 2017), leading to high agrochemical trading. A review of Ghana's agrochemical trade flow pattern revealed that fertilisers and pesticides are the highly traded products (Fianko *et al.*, 2011). Agrochemicals approved for trading increased between 2006 and 2011, doubling between 2011 and 2015 (Diarra & Tasie, 2017). As agrochemical trading increases, income from traders is expected to increase.

Meanwhile, previous studies (Baba & Asante, 2012; Abdul–Razak & Adafula, 2013; Gatsi, Gadzo, & Kportorgbi, 2013; Agyei and Gyamerah, 2014; Muazu *et al.*, 2015; Bedi, 2016; Acheampong, Debrah, & Yeboah, 2016; Adu & Amponsah, 2020; Mensah, Amrago, Asare, Tutu, & Donkor, 2020; Amamoo, 2020) on tax compliance conducted in Ghana do not specifically focus on tax morale of agrochemical traders despite the tremendous growth of the industry (Osei *et al.*, 2013; Denkyirah *et al.*, 2016; Danso-Abbeam & Baiyegunhi, 2017). Besides, studies on agricultural tax are few. Wang and Shen (2014) examined the effect of China's agricultural tax abolition on rural families' incomes and production; Shi and Ye (2018) studied China's abolition of the agricultural tax, local governments' responses and economic growth; Mensah *et al.* (2020) investigated poultry farmers' willingness to pay agricultural tax, while Dumortier and Elobeid (2021) explored the effects of a carbon tax in the United States on agricultural markets and carbon emissions from land-use change. Most of these studies

focussed on the effects of tax payment on general agricultural performance. However, in an attempt to fill the gap in the literature on tax morale amongst agrochemical players and add to the little literature on agricultural tax in developing countries (particularly, Ghana), this study examined tax morale amongst agrochemical traders by segregating tax morale into levels of quartiles, thereby finding the factors which influence each quartile. Also, like businesses anywhere, African businesses aim at taking risks to maximise profit. For this course, the economic deterrence theory was relied upon to assess the relationship between authorities' power and traders' tax morale. Given this, the first to analyse is the tax knowledge and the factors influencing the tax knowledge of agrochemical traders. Second is to examine the determinants of tax morale of the traders.

2. Literature review
2.1 Tax knowledge review
Taxpayers' level of alertness to tax rules and regulations constitutes tax knowledge, Adu and Amponsah (2020). Tax knowledge could be referred to as the information about tax someone knows. Information regarding tax rules and regulations revolves around tax reporting, calculating and payment. According to Tarjo and Kusumawati (2006), tax calculation knowledge permits the taxpayer to compute his or her tax due based on the tax rules. To calculate one's tax due for a particular assessment year, the Ghana Income Tax Act (2015) requires the taxpayer to consider the year's income, allowable expenditures, depreciation allowable, capital allowance and applicable tax reliefs. It is revealed that the knowledge relating to taxable income computation affects tax knowledge, which results in compliance (Palil & Mustapha, 2011). For instance, it was revealed in Kenya that tax knowledge negatively influences tax compliance (Lumumba, Migwi, & Magutu, 2010). On the other hand, failure to be conversant with tax payment knowledge does not promote tax knowledge, which may lead to delays and fines.

2.2 Tax morale
Tax morale is the intrinsic factor that motivates taxpayers to pay taxes (Muazu *et al.*, 2015). In the past, Daude, Gutiérrez, and Melguizo (2012) described tax morale as the motivation factor by which citizens of a country pay their tax obligations. Thus, tax morale is defined as the state in which taxpayers are intrinsically motivated as a key element that indicts them to obey the law, settle tax obligations or feel guilty for not complying with the law (Luttmer and Singhal, 2014). In times past, there have been a plethora of studies on tax morale by numerous researchers (Halla, 2012; Doerrenberg and Peichl, 2013; Filippin, Fiorio, & Viviano, 2013; Bilgin, 2014; Luttmer and Singhal, 2014; Muazu *et al.*, 2015; Yew *et al.*, 2015; Nichita, 2015). For example, Doerrenberg & Peichl (2013) examined the effects of a progressive tax on tax morale. Using a cross-country analysis, Doerrenberg & Peichl (2013) found women and married people to be high tax morale possessors compared to men and singles. In addition, religiosity was revealed to affect tax morale positively. In confirmation, religion – as a demographic factor – was observed to affect tax morale positively in Turkey (Bilgin, 2014). However, Bilgin's (2014) study, using data from the World Value Survey, yielded different results amongst countries. Regarding statistically significant related issues, age, educational level and income level were significant determinants of tax morale (Bilgin, 2014). Further, Yew *et al.* (2015) revealed that income level influenced motivation to pay tax inversely. Additionally, gender, educational level and income level were revealed to positively influence motivation to pay tax (Muazu *et al.*, 2015). Given these, this study hypothesised that.

H1. Socioeconomic variables (age, gender, educational level and religion) influence tax morale.

Job performance variables selected were business size, monthly sales and awards received by the firm. The business size was measured based on the number of employees. It is revealed that the tax morale of firms decreases as their size enlarges (Alm & McClellan, 2012). According to Alm and McClellan (2012), larger firms are likely to be attractive to tax authorities because tax authorities see such firms as revenue maximisers. Muehlbacher, Kirchler and Schwarzenberger (2011) revealed that taxpayers' willingness to pay tax decreases when income increases. Recently, in Yugoslavia, Crnogorac and Lago-Peñas (2020) revealed an inverse relationship between income and tax morale. Given the earlier studies' results, the study hypothesised that.

H2. Job performance has influence on tax morale.

Perception of tax officers' job performance was categorised as: demonstration of integrity in discharging one's duty and exhibition of power as a tool for discharging one's duty. The study used the elements of trust (respect and trust of authorities to measure tax officers' integrity), following Inasius (2019a, b). Trust is revealed to positively influence tax morale (Yew *et al.*, 2015). However, Muelbacher *et al.* (2011) found that taxpayers' willingness to settle tax obligations voluntarily increases when they perceive trust amongst authorities. The demonstration of power by authorities in discharging duty was based on the power to sanction and lock down firms. According to prior studies (Muelbacher *et al.*, 2011; Inasius, 2019a, b), the willingness to comply with taxation is influenced by authorities' power. Given the aforestated discussion, it is hypothesised that.

H3. Perception of the job of tax officers influences tax morale.

2.3 Theoretical framework

The economic model of crime theory proposed by Becker (1968) states that taxpayers consider cost, benefits and other economic objects (profit and risk) to enhance moral utility. Hence, crime is said to have been committed when a taxpayer anticipates that the utility of indulging in a crime overrides the utility of embarking on a legitimate activity. In agreement, Atawodi and Ojeka (2012) declare taxpayers to be moral utility maximisers guided by profit and risk. Before, Alm and Torgler (2011) supported the theory by stating that taxpayers usually compare the risky paybacks of cheating (underreporting of income, leading to tax evasion) and the risk of being caught when cheating before taking a stand. However, the economic model of crime theory shares the same view as the economic deterrence theory; just that Luttmer and Singhal (2014) find the economic deterrence theory as the direct application of the economic model of crime. The theoretical framework of the economic deterrence theory is bounded by the tax rate, detection risk and the level of punishment for the cheater. For this course, a taxpayer will likely fail to comply when he or she anticipates a lesser cost of being detected and punished than gains from tax evasion (Bejaković & Bezeredi, 2019). Following prior literature on tax morale (Alm & McClellan, 2012; Lisi, 2019), this study is underpinned by the economic deterrence theory.

2.4 Conceptual framework

Figure 1 presents the conceptual framework employed for this study. The factors predicted to influence tax morale were categorised under socioeconomic factors, job performance, perception of the job of tax authorities and tax knowledge. The socioeconomic features encompassed age, gender, educational level, religion, marital status and legal status of firms. The job performance features conceptualised to influence tax morale included the size of the firm, monthly sales and awards received. Moreover, the perception of the job of tax authorities was further grouped under the integrity of tax officers (trust) and the power exhibited by tax authorities; included in authorities' integrity are respect, honour
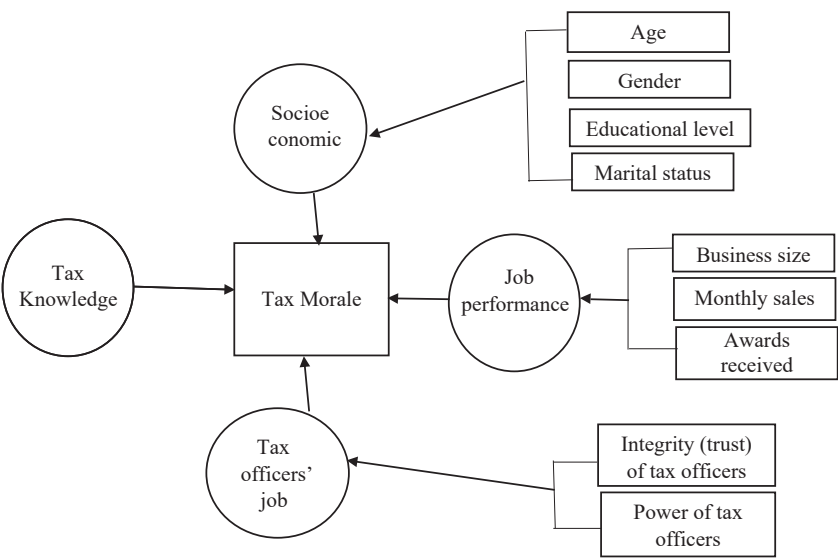
Figure 1.
Conceptual framework

and trustworthiness; the power of authorities covered expertise in detecting evasion, lockdown and sanction. The latter are principal variables from the economic model of crime theory.

3. Methodology

3.1 Study area
The study examines the level of tax compliance amongst agrochemical traders across the Bono Region, Bono East Region and Ahafo Region in Ghana. These regions were selected as they represent the second-largest agricultural zone in Ghana and are characterised amongst the major users of agrochemicals (Danso-Abbeam & Baiyegunhi, 2017; Opoku, Bannor, & Oppong-Kyeremeh, 2020), with high agrochemical trading. For a detailed view of the geographical location, please refer to the selected region – Figure 2. Out of the regions, four districts were selected from each region for the studies.

3.2 Sampling
The study employed multistage sampling to arrive at the sample size. Purposive sampling was used in selecting the three regions (Bono, Bono East and Ahafo) due to the major agricultural activities, leading to high usage of agrochemicals in the areas (refer to 3.1 for the detailed reasons). In the second stage, the three regions' capital towns were selected given that they are the major trading centres for agrochemicals. Finally, a simple random sampling was later employed in selecting the respondents. However, based on the agrochemical registered list delivered by the Plant Protection and Regulatory Service Department, 92 respondents were selected, representing the entire registered traders. The list contained 119 registered traders across the regions; however, 92 were in active operation during the study.

3.3 Method of data analysis and measurement of variables
Exploratory factor analysis (EFA) was employed to examine factors that influence agrochemical traders' tax knowledge. The Kaiser–Meyer–Olkin (KMO) test was conducted
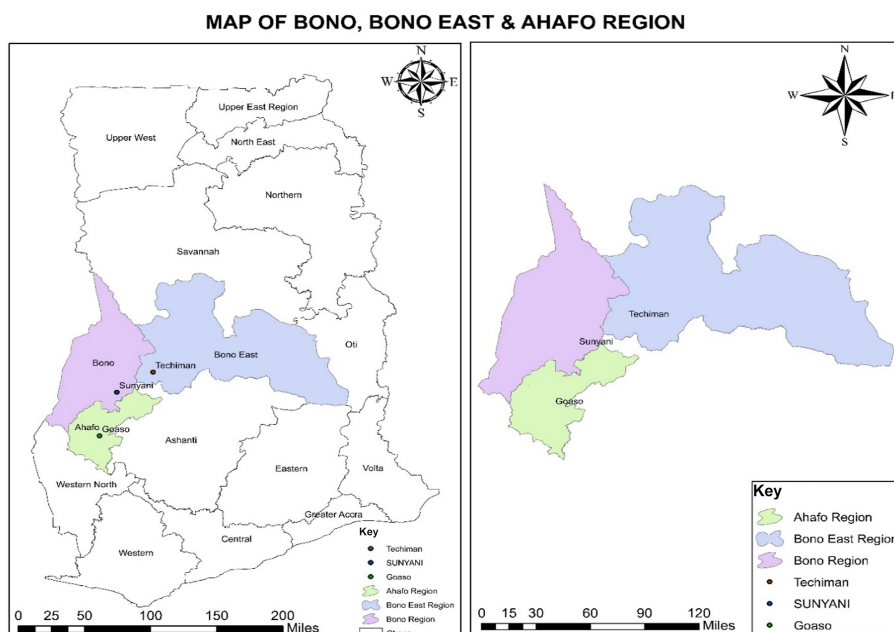
MAP OF BONO, BONO EAST & AHAFO REGION

Figure 2.
Study area map

to test sampling adequacy, validity and consistency. According to Chawla and Sondhi (2011), factor analysis is a method used to reduce many variables to wieldy factors that explain the endogenous variable. While Chawla and Sondhi (2011) explained that, the number of variables used for the facto analysis multiplied by 5 give an adequate sample size for EFA, de Winter, Dodou, and Wieringa (2009) revealed that even though EFA requires a simple size of 50 or above, a sample size of less than 50 could give useful analysis in behavioural studies. Therefore, a sample size of 92 is deemed reliable for factor analysis in this study.

Empirically, the factor analysis was expressed as:

$$Fi = Wi1X*1 + Wi2X*2 + Wi3X*3 + \ldots + WikX*_k$$

where Fi = Estimate of ith factor, $X1*$ = ith standardised variable, Wi = Weight or factor score coefficient for ith standardised variable and K = Number of variables.

For the sake of this study, tax knowledge was measured based on tax calculation knowledge, tax reporting knowledge and tax payment knowledge, following Al-Ttaffi, Bin-Nashwan, and Amrah (2020). Tax reporting knowledge was obtained using six questions. Objective (alternative) answers numbered one to five were provided to respondents for each question that was asked. For the provided answers, 1 = definitely wrong (very low level of understanding), 2 = probably wrong (low level of understanding), 3 = doubt (medium level of understanding), 4 = probably true (high level of understanding) and 5 = must be true (very high level of understanding).

Four questions about tax payment deadlines, penalties, claim of tax relief and applications for payment schedules were used to measure tax payment knowledge. Answers to the questions followed that of tax reporting knowledge and was measured as elaborated.

To measure tax calculation knowledge, eight questions about income subject to tax or not, tax type and its applicable mode of computation, tax reliefs available, allowable expenses and

non-allowable expenses, capital allowance treatment, treatment of expenses relating to repairs, treatment of open and closing inventory and available concessionary tax rates were posed. Once again, this variable (tax calculation knowledge) measurement was done as the variable of tax reporting knowledge.

Tax morale amongst agrochemical traders was analysed using quantile regression (QR) analysis and ordinary least square (OLS). The OLS was used to check the robustness of the regression analysis. The regressed variable is a measure of tax morale, and it was based on the data from the structured questionnaire. The study employed two proxies to analyse the factors influencing traders' tax morale. Firstly, a 10-point scale (with 1 = Never justifiable, 2 = Almost never justifiable, 3 = Rarely justifiable, 4 = Occasionally but infrequently justifiable, 5 = Neither never nor always justifiable, 6 = Sometimes justifiable, 7 = Often justifiable, 8 = Frequently justifiable, 9 = Almost always justifiable, 10 = Always justifiable) form of questions were asked. Nonetheless, for easy interpretation, the dependent variable was recoded using a scale from 1 to 3, with 1 being 'always justifying cheating' and 3 for 'never justifying cheating'. On this note, presentation of individual views was recoded as 1 = 3, 2–9 = 2 and 10 = 1.

The QR analysis is presented as follows.

The two-variable regression is assumed as:

$$A_i = M_1 + M_2 + X_i + u_i \tag{1}$$

In OLS regression, the error sum of square is minimised.

$$\sum u_i^2 = \sum (A_i - M_i - M_2 X)^2 \tag{2}$$

The two ordinary equations obtained are set to zero, which are solved simultaneously. This is done to minimise the error sum of squares for the two parameters.

Nonetheless, the absolute sum of error is minimised in QR:

$$\sum |u_i| = \sum |A_i - M_i - M_2 X_i| \tag{3}$$

Hence, the parameter values that minimise the sum of absolute errors are calculated. If $\hat{A}_i$ is the estimated value of A_i in Equation (3), then Equation (3) amounts to minimising

$$\sum u_i = \sum |A_i - \hat{A}_i| \tag{4}$$

The median regression line (0.50 quantile), which can be called the least-absolute deviation (LAD) estimator (Gujarati, 2015), is obtained when Equation (4) is minimised. In a regression of such kind, half of the observations lie above the line and the other half below the line. When minimising Equation (4), the estimated errors above and below the line receives equal weights. Possibly, the LAD estimator can be generalised to the kth quantile estimators; nonetheless, the errors above and below the kth quantile do not receive equal weights. Subsequently, in order to estimate the kth quantile, a single regressor is employed in the expression below which is minimised:

$$Min \sum_{i=1}^{n} \lambda_k (A_i - XM) = K \sum_{(A_i - XM) > 0} |A_i - XM| + (1-k) \sum_{(A_{i-XM}<0)} A_i - XM \tag{5}$$

where $XM = M_1 + M_2 X_i$; $0 < k < 1$; and λ_k is a measure of the weighted distance of the quantile. If $\hat{A}_i^k = \hat{M}_2^K X_i$, the estimated kth quantile, Equation (5), amounts to minimising the weighted sum of residuals $\sum |\hat{A} - A_i|$, with positive residuals receiving a weight of k and

negative residuals receiving a weight of $(1-k)$. The first sum in Equation (5) is the sum of vertical distances of observations above the estimated quantile, and the second sum is the vertical distances of observations below the estimated quantile.

The OLS is specified as follows:

$$In\,(T_{mi}) = \beta_0 + \beta_1 InX_{1i} + \beta_2 InX_{2i} + \beta_3 InX_{3i} + \beta_4 InX_{4i} + \beta_5 InX_{5i} + \beta_6 InX_{6i} + \beta_7 InX_{7i}$$
$$+ \beta_8 InX_{8i} + \beta_9 InX_{9i} + \beta_{10} InX_{10i} + \beta_{11} InX_{11i} + \beta_{12} InX_{12i} + \beta_{13} InX_{13i} + \beta_{14} InX_{14i}$$
$$+ \beta_{15} InX_{15i} + \beta_{16} InX_{16i} + \beta_{17} InX_{17i} + \varepsilon_i$$

where T_{mi} represents Tax morale of the agrochemical traders, X_{1i} is age, X_{2i} denotes gender, X_{3i} represents level of education, X_{4i} is religion, X_{5i} is Christian denomination, X_{6i} stands for marital status, X_{7i} denotes legal status, X_{8i} is work experience, X_{9i} represents business size, X_{10i} is monthly sales, X_{11i} stands for number of awards, X_{12i} is respect, X_{13i} denotes honesty, X_{14i} is trustworthy, X_{15i} represents expertise, X_{16i} stands for sanction and X_{17i} represents tax knowledge. Moreover, $\beta_1, \beta_2, \ldots \ldots \beta_{17}$ represent the parameters to be predicted. ε_i stands for the error term and In denotes the natural logarithm operator.

4. Results and discussions
Respondents' demographic information was analysed using descriptive statistics (frequencies, mean, standard deviation and percentages).

4.1 Description of study area
Bono East had the largest share of respondents – 39 (representing 42.39%) out of the 92 (Table 1). Under Bono East, Techiman (the capital town of Bono East Region) recorded 28 respondents, confirming the study of Diarra and Tasie (2017), Kintampo had 7; and Nkronza and Tuobodom recorded 2 each. Following the Bono East Region is the Ahafo Region. The Ahafo Region had 30 respondents (representing 32.61%). Out of the 30 respondents from the Ahafo Region, 12 came from Duayaw Nkwanta, 11 came from Goaso, Bechem had 4 and Derma had three. From Table 1, 23 respondents (representing 25%) out of the 92 respondents interviewed were from the Bono Region. Amongst the 23 respondents, six were from Sunyani town, five were from Berekum, six were from Dormaa Ahenkro and six were from Wenchi.

From Table 2 below, the mean age was 37. This reveals a synergy amongst the various age groups of respondents interviewed, as their age profile was spread across the various age groups. Looking at age in detail, Table 2 shows that 42 of the respondents (45.65%) were between the ages of 31 and 51, 36 respondents (representing 39.13%) were below the age of 31, and 14 respondents (representing 15.22%) were above 51 years. The majority of the respondents fall under the age of 50, implying that the agrochemical traders are within their economically active age assemblage, as classified by the Ghana Statistical Service (2014). About 74% of the respondents interviewed, representing 68 respondents, were males, while 26%, representing 24, were females. This indicates male dominance in the agrochemical trade across the three regions (Bono, Bono East and Ahafo). However, the mean mark of gender was 0.26. On the marital status of respondents, 59 of them were found to be married, 30 were single and only three were divorced – all representing 64%, 33% and 3%, respectively. About 40 respondents (43.48%) had had senior high education, 24 (representing 26.09%) had had only junior high education, 15 had obtained a diploma certificate, while 12 (13.04%) and one (1.09%) had acquired a first and postgraduate degree, respectively. In summary, the result shows that most of the respondents have completed high school. The implication is that they can read, write and

Region	Districts	Town	Traders surveyed	Percentage
Bono				
	S. M. A	Sunyani	6	6.52%
	B. M. A	Berekum	5	5.43%
	D. M. A	Dormaa Ahenkro	6	6.52%
	W. M. A	Wenchi	6	6.52%
Subtotal			23	25%
Bono East				
	T. M. A	Techiman	28	30.43%
	K. M. A	Kintampo	7	7.61%
	N. M. A	Nkoranza	2	2.17%
	T. N. D. A	Tuobodom	2	2.17%
Subtotal			39	42.39%
Ahafo				
	A.N. M. A	Goaso	11	11.96%
	T.S. M. A	Bechem	4	4.35%
	T. N. M. A	Duayaw Nkwanta	12	13.04%
	T. S. D. A	Derma	3	3.26%
Subtotal			*30*	*32.61%*
Grand total			*92*	*100%*

Note(s): NB: S.M.A (Sunyani Municipal Assembly), B.M.A (Berekum Municipal Assembly), D.M.A (Dormaa Municipal Assembly), W.M.A (Wenchi Municipal Assembly), T.M.A (Techiman Municipal Assembly), K.M.A (Kintampo Municipal Assembly), N.M.A (Nkoranza Municipal Assembly), T.N.D.A (Techiman North District Assembly), A.N.M.A (Asonafo North Municipal Assembly), T.S.M.A (Tano South Municipal Assembly), T.N.M.A (Tano North Municipal Assembly) and T.S.D.A (Tano South District Assembly)

Table 1.
Distribution of towns and the number of surveys conducted

understand tax rules, excluding technicalities. However, it is argued that taxpayers incur compliance costs regarding tax technicalities (Saad, 2014). Forty-seven respondents were managers, while 44 were owners and managers simultaneously. Only one of the respondents was the owner and had no managerial role. Of the 92 agrochemical traders interviewed, 62 (67.39%) are into other employment besides agrochemical trading. Nonetheless, 30 respondents (representing 32.61%) have agrochemical trading as their primary and only job. At the end of the survey, 49 (53.26%) respondents had 1 to 5 years' worth of working experience. Twenty-six (28.26%) had more than 10 years of working experience, while 17 respondents (18.48%) had between 6 and 10 years of working experience.

The number of employees within the shops where respondents were interviewed was also investigated. Table 2 shows that 52 respondents (56.52%) were in a shop with more than one but less than four employees. Thirty-five respondents (representing 38.04%) found themselves the only ones employed in their shops, while five (5.43%) worked in shops with more than three but less than eight employees. Under legal status, it was revealed in the table that 71 (77.17%) out of the 92 respondents had their firms registered under sole proprietorship. Meanwhile, 20 respondents (representing 21.74%) had theirs registered under the company's code, 1963 (Act 179) and only one respondent (1.09%) was found to be in a firm registered under the partnership act, 1962 (Act 152) as amended. All respondents (92), representing 100%, agreed that their tax was administered by the small tax office (STO) division of the Ghana Revenue Authority. The religion of respondents was also considered. This is because religion is a significant, influential factor in tax compliance (Carsamer and Abbam, 2020). In detail, 82 out of the 92 respondents were Christians, representing 75.44%. On the other side, nine were Muslims, representing 8.28%, while only one (0.92%) did not belong to any religion.

Item	Frequency	Percentage	Mean	Std. Dev
Age			36.804	11.813
<31	36	39.13%		
31–50	42	45.65%		
>50	14	15.22%		
Gender			0.261	0.442
Male	68	73.91%		
Female	24	26.09%		
Marital status			1.391	0.554
Married	59	64.13%		
Single	30	32.61%		
Divorced	3	3.26%		
Level of education			2.196	1.008
Junior high	24	26.09%		
Senior high	40	43.48%		
Diploma	15	16.30%		
First degree	12	13.04%		
Master's/PhD	1	1.09%		
Job position			1.967	0.999
Owner	1	1.09%		
Owner and manager	44	47.83%		
Main work			0.674	0.471
Agrochemical only	30	32.61%		
Not agrochemical only	62	67.39%		
Work experience			8.576	7.456
1–5	49	53.26%		
6–10	17	18.48%		
Above 10	26	28.26%		
Number of employees			2.130	1.286
1	35	38.04%		
2–3	52	56.52%		
4–7	5	5.43%		
Legal status			1.446	0.830
Sole proprietorship	71	77.17%		
Partnership	1	1.09%		
Private company	20	21.74%		
Tax administration			1	0
Small tax office	92	100%		
Religion			2.620	1.047
Christianity	82	75.44%		
Islam	9	8.28%		

Table 2.
Demographic
information of
respondents

4.2 Factors influencing the tax knowledge of traders

The consistency and validity of the factors were tested by measuring the strength of the factor analysis. KMO test was used. From Table 3, the KMO figure (0.70) has a value greater than 0.5. This implies that it is practicable to use factor analysis for the data collected for this survey. In addition, Bartlett's test of sphericity, a vital trait to be considered for factor analysis, was used. It revealed a p-value of less than 1%, implying a significant association matrix between the factor analysis variables used in this study.

Factor analysis was used to extract the main factors influencing the tax knowledge of agrochemical traders. Following Bannor, Ros-Tonen, Mensah, Derkyi, and Nassah (2021), a cut-off point of 0.5 was used for the factor loading. Three main factors were extracted using the 0.5 cut-off point. These three factors were the factors that best influence the tax knowledge of

agrochemical traders in the area of tax reporting knowledge, tax payment knowledge and tax calculating knowledge (refer to Tables 4 and 5). The result is consistent with past studies (Adiasa, 2013; Saad, 2014; Oladipupo & Obazee, 2016; Damajanti & Karim, 2017). Adiasa (2013) concluded that taxpayer knowledge of taxation affects willingness to comply with tax. Malaysian SMEs were found to have less technical knowledge of taxation; hence, they were complying less to tax (Saad, 2014). In Nigeria, Oladipupo and Obazee (2016) confirmed that tax compliance is positively influenced by tax knowledge. Moreover, Damajanti & Karim (2017)

Kaiser–Meyer–Olkin measure of sampling adequacy (overall)		0.700
Bartlett's test of sphericity	Approx. Chi-square	360.766
	Degrees of freedom	91
	p-value	***0.000

Source(s): Authors' computation based on field data, 2021. H0: variables are not intercorrelated. *** represents 1% significant level

	Factors			
Variables	1	2	3	Eigenvalues
X1	0.752			3.815
X2	0.856			1.714
X3	0.642			1.621
X4	0.634			1.032
X5	0.522			0.957
X6	0.581			0.936
X7		0.751		0.827
X8		0.702		0.796
X9		0.634		0.559
X10			0.500	0.470
X11			0.501	0.454
X12			0.510	0.205

Note(s): NB: Principal component factor was the method employed in the study. Pattern matrix with a cut-off point of 0.5 was used for factor loading for naming the factors
Source(s): Authors' own computation based on field data, 2021

Factor 1: tax reporting knowledge
X1: Tax returns are expected to be filled for an accessible period
X2: Accurate revenue and expenditure are to be reported for the period
X3: Maintaining proper records will help to ascertain revenue and expenditure for a period
X4: The taxpayer is expected to use the returns forms prescribed by GRA
X5: Late submission of tax report attracts penalty
X6: The taxpayer has the right to extend the reporting period

Factor 2: tax payment knowledge
X7: The revenue act gives a payment deadline
X8: Failure to meet payment deadline attracts penalty
X9: The taxpayer has the right to propose a payment schedule for consideration

Factor 3: tax calculation knowledge
X10: The taxpayer has the right to claim a tax credit on losses
X11: Revenue that has suffered a final withholding tax is not included in tax computation
X12: Drawings are treated as Income for the period of assessment

studied tax reporting knowledge, tax calculating knowledge and tax payment knowledge, which is more similar to this study. They (Damajanti & Karim, 2017) found that citizens of the Central Java Region (Indonesia) demonstrated high knowledge of tax reporting, calculation and payment, therefore, a positive impact was revealed.

However, each factor extracted denotes a linear combination of variables inferred from the response pattern. In all, the factors represented 12 variables (refer to Table 5).

4.3 Determinants of tax morale amongst agrochemical traders

Presented in Table 6 are the results of OLS together with QR. The QR has estimates from 0.05, 0.25, 0.5 and 0.75 quantiles. Using the OLS estimate of 0.127 as base, age positively influences agrochemical traders' tax morale. A similar result was in the study, "Tax Morale, Eastern Europe and European Enlargement", by Torgler (2012). On the same page, findings from Daude, Gutierrez, and Melguizo (2013) and Williams and Krasniqi (2017) emphasised the positive influence of age on tax morale. However, the influence is not all that strong at each quantile. Also, this effect was statistically significant at the 0.5 and 0.75 quantiles. Emphatically, in previous literature (Alasfour, Samy, & Bampton, 2016), age influenced tax morale significantly. The cost of sanctions given to frequent evaders, including dilapidation of social status, could be the possible factors that positively fuel older people's tax morale.

Except at the median quantile, gender has a significant and negative influence on agrochemical traders' tax morale at the lowest quantiles. This is true with Hug and Spörri (2011); however, it contradicts the findings of Doerrenberg & Peichl (2013), Cyan, Koumpias, and Martinez-Vazquez (2016) and Bejaković and Bezeredi (2019). Nonetheless, the negative influence of gender on tax morale could confirm the study by Torgler (2005). According to Torgler (2005), women are assumed to reduce their positive tax morale habits because the women of today's generation are much more independent than the older generation. On the part of education, SHS saw a positive impact on tax morale. This effect was very strong at the lower and the low quantiles (0.05 and 0.25) and was statistically significant at the 0.05 and 0.25 quantiles. This was not so with the findings of Cyan *et al.* (2016), a negative effect was rather found.

Diploma-level education has a negative effect at all quantiles except the lowest quantile; this impact is strong at the upper quantiles (0.5 and 0.75) but statistically significant at only the upper quantile (0.75). First-degree level of education has a strong but negative impact on tax morale at all quantiles, including the OLS estimate. Statistically, this effect is significant at 0.05 and the median quantiles only. Master's or postgraduate education level negatively influences Agrochemical traders' tax morale at all quantiles and the OLS estimates. However, it was statistically significant at only 0.05 quantile. The picture portrayed by education is that education negatively influences tax morale as education increases. The possible cause could be that the educated perceive an asymmetric relationship between government fiscal policies and the expected benefits of citizens. The results are broadly in line with Torgler *et al.* (2007) but contradict the results of Muazu *et al.* (2015), Cyan *et al.* (2016) and Crnogorac and Lago-Peñas (2020).

Religion –Christianity and Islam – significantly impact tax morale positively at all quantiles. It was also broadly in line with the findings of Doerrenberg & Peichl (2013), Torgler (2012), Bilgin (2014) and Agbetunde, Raimi, and Akinrinola (2022). It could be because taxpayers understand that paying taxes contributes to the provision of general public goods (Crnogorac and Lago-Peñas, 2020). Partnership strongly and negatively influences the tax morale of agrochemical traders, with a high regression coefficient of −1.626 and −1.608 at 0.5 and 0.75 quantiles, respectively. This asserted that the influence of partnership on tax morale behaviours decreases drastically amongst individuals with high tax morale character. Despite its negative influence, partnership was statistically significant at all quantiles; that is, 1%, 10%, 5% and 5% at 0.05, 0.25. 0.5 and 0.75, respectively. On the other hand, private company positively influences tax morale at all quantiles, excluding the 0.25 quantile, which negatively impacts tax morale. Meanwhile, it is statistically significant only at the lowest

Variables	OLS estimates	Quantile regression estimates			
		0.05	0.25	0.5	0.75
Socioeconomic variables					
Age	0.013	0.005[***]	0.012	0.007	[***]0.026
	(0.009)	(0.001)	(0.011)	(0.010)	(0.009)
Gender					
Female	−0.021	[***]−0.177	−0.059	0.045	−0.063
	(0.153)	(0.033)	(0.193)	(0.180)	(0.151)
Educational level					
S H S	0.021	[***]0.604	[**]0.555	0.089	0.024
	(0.195)	(0.043)	(0.246)	(0.230)	(0.192)
Diploma	[*]−0.409	0.026	−0.089	−0.306	[*]−0.384
	(0.216)	(0.047)	(0.274)	(0.255)	(0.214)
First degree	[**]−0.581	[***]−0.564	−0.417	[*]−0.463	−0.320
	(0.262)	(0.057)	(0.331)	(0.308)	(0.259)
Master's/PhD	−0.622	[***]-1.05	−0.351	−0.344	−0.829
	(0.719)	(0.157)	(0.908)	(0.846)	(0.711)
Religion					
Christianity	[***]2.248	[***]2.77	[**]2.177	[***]2.121	[***]2.065
	(0.673)	(0.147)	(0.850)	(0.792)	(0.665)
Islam	[***]1.932	[***]1.819	[**]2.051	[***]2.125	[***]2.004
	(0.674)	(0.147)	(0.851)	(0.793)	(0.666)
Christian denomination					
Orthodox	0.012	[***]0.245	0.227	0.211	−0.331
	(0.247)	(0.054)	(0.313)	(0.291)	(0.245)
Charismatic	0.053	[**]0.095	0.089	0.142	−0.032
	(0.211)	(0.046)	(0.266)	(0.248)	(0.208)
Marital status					
Single	0.013	−0.046	−0.337	−0.087	[*]0.263
	(0.178)	(0.039)	(0.225)	(0.210)	(0.176)
Divorced	[*]−0.635	[***]−0.996	[**]−1.084	−0.651	0.227
	(0.387)	(0.084)	(0.490)	(0.456)	(0.383)
Legal status					
Partnership	[**]−1.499	[***]−1.415	[*]−1.423	[**]−1.626	[**]−1.608
	(0.617)	(0.135)	(0.780)	(0.726)	(0.610)
Private company	0.090	[***]0.182	−0.169	0.033	0.263
	(0.184)	(0.040)	(0.233)	(0.217)	(0.182)
Work experience	−0.118	[***]-0.517	−0.070	0.127	−0.059
	(0.202)	(0.044)	(0.255)	(0.238)	(0.200)
Job performance variables business size					
Medium	−0.017	[**]0.067	0.055	−0.038	0.059
	(0.142)	(0.031)	(0.188)	(0.168)	(0.141)
Large	−0.194	[***]0.498	−0.158	−0.254	−0.112
	(0.358)	(0.078)	(0.452)	(0.421)	(0.354)
Monthly sales	−3.480	[***]−4.04	2.530	1.950	−9.230
	(0.120)	(1.560)	(8.990)	(8.380)	(7.040)

Table 6.
Factors that influence tax morale among agrochemical traders

(*continued*)

Variables	OLS estimates	Quantile regression estimates			
		0.05	0.25	0.5	0.75
Award number	0.157	***0.207	0.150	0.110	0.157
	(0.111)	(0.024)	(0.141)	(0.131)	(0.110)
Perception of tax officers' integrity					
Respect	−0.051	***−0.136	−0.026	−0.002	−0.066
	(0.073)	(0.016)	(0.092)	(0.085)	(0.072)
Honesty	*0.210	−0.025	0.008	0.099	**0.250
	(0.116)	(0.025)	(0.146)	(0.136)	(0.114)
Trustworthy	−0.129	***0.135	−0.069	−0.047	−0.105
	(0.113)	(0.025)	(0.143)	(0.133)	(0.112)
Perception of job of tax officers					
Expertise	−0.081	***−0.246	−0.051	−0.060	0.024
	(0.073)	(0.016)	(0.092)	(0.085)	(0.072)
Lockdown	*0.073	0.010	0.071	0.071	**0.102
	(0.043)	(0.009)	(0.054)	(0.050)	(0.042)
Sanction	−0.005	***0.085	0.036	0.018	−0.007
	(0.052)	(0.011)	(0.066)	(0.061)	(0.052)
Tax knowledge	0.325**	***0.536	*0.305	0.129	−0.099
	(0.155)	(0.033)	(0.196)	(0.183)	(0.153)
Cons	−0.755	***-1.750	−1.033	−0.762	−0.970
	(0.772)	(0.169)	(0.975)	(0.910)	(0.763)
Prob > *F*	0.005				
R Square	0.508				
Pseudo R^2 =		0.531	0.331	0.433	0.321
Brush Pagan/cook-Wiesberg test (Prob > χ^2)		0.010			

Note(s): NB: Significance; 1% = ***, 5% = ** and 10% = *. NB: QR and OLS are short forms of quantile regression at different quantiles and ordinary least squares regression, respectively. Figures in parentheses are robust standard error. Lockdown means tax authorities use padlock to lock shops of tax evaders
Source(s): From authors' computation based on 2021 field data.

Table 6.

quantile (0.05). The OLS estimate also revealed partnership's strong but negative influence on tax morale. Considering private companies, on the other hand, the OLS shows a positive impact of a private company on tax morale. The revelation recorded by the quantile and OLS regressions imply that partnership firms are less likely to exhibit tax morale than firms registered under the company's code, 1963 (Act 179). Per the Income Tax Act 2015, Act 896 of Ghana, partners are taxed separately on their profit share. For this cause, it could be concluded that partners could underreport their share of profit to reduce their taxable amount to retain their maximised profit; hence, low tax morale is seen amongst them. The coefficients of work experience revealed a negative impact on tax morale based on the OLS estimate and across all quantiles except the median quantile. Nonetheless, it is statistically significant at the lower quantile. According to Gangl, Hofmann, and Kirchler (2015), repeated good experiences with authorities through the years establish implicit trust, which motivates one to pay taxes voluntarily. Following Kirchler, Hoelzl, and Wahl (2008), the possible cause for the contradictory results could be that the traders perceive their experience with authorities to be negative, which creates a "cops and robbery" environment.

Under business size, tax morale is positively affected by medium firms at all quantiles except the median quantile and the OLS estimate. However, it is significant at the lower quantile (0.05) only. Large firm size also has a negative impact on traders' tax morale based on the OLS estimate and across all quantiles, except 0.05 quantile, which has a positive impact on tax morale.

The possible reason could be that large firms find taxes as obstacles (Alm and McClellan, 2012). Alm and McClellan (2012) stressed that the attention of larger firms is attracted to tax authority since these firms are viewed as potential revenue maximisers (high revenue). Similarly, the results were not statistically significant across all quantiles except 0.05, which was 1% significant. Added to this, the 0.05 quantile has the strongest (0.498) impact amongst all the quantiles. This implies that the tax morale amongst agrochemical traders increases with larger firm operators at the lower (0.05) quantile but declines at 0.25, 0.5 and 0.75 quantiles, respectively.

Monthly sales negatively influence tax morale based on the OLS estimate: lower quantile (0.05) and upper quantile (0.75). This notwithstanding, the influence was the strongest at the upper quantile (−9.230). The high unfavourable value indicates that the influence of monthly sales on tax morale is crucial at the upper quantile. This negative relation of income (monthly sales) was emphasised by Crnogorac and Lago-Peñas (2020). It also confirms previous studies (Muehlbacher *et al.*, 2011; Yew *et al.*, 2015). An unstable economic environment could be a plausible reason accounting for the decrease in tax morale of the group with high tax morale (0.75) as their income increases (Crnogorac and Lago-Peñas, 2020). This is because when the economic environment is unstable, everyone becomes dissatisfied with his or her level of income; hence, the motivation to pay tax decreases (Alm and McClellan, 2012).

The results revealed that respect negatively impacts the tax morale of agrochemical traders based on the OLS estimate and across all quantiles. The impacts seem not too strong; however, they are statistically significant at the lower quantile. Based on the OLS estimate and 0.25, 0.5 and 0.75 quantiles, tax morale was positively influenced by honesty. The coefficients of the OLS estimate and those of the upper quantile were statistically significant at 10% and 5%, respectively. Expertise negatively influences tax morale from the OLS estimate and 0.05, 0.25 and the median quantiles. However, it was statistically significant at only the lower quantile. This result confirms the revelation of Inasius (2019a, b). According to Inasius (2019a, b), trust (element of trust: respect, trustworthiness and expertise and knowledge of authorities) was found to have a negative impact on taxpayers' willingness to pay tax, as revealed by the study.

On the other hand, lockdown positively influences tax morale and is statistically significant at only the upper quantile (0.75), with a high regression value of 0.102. This suggests that individuals with high tax morale are likely to experience an increase in tax morale when they face lockdown.

According to the results presented in Table 6 above, sanction impacts positively on tax morale, relying on the values across all quantiles, except at the 0.75 quantiles and the OLS estimate where sanction is revealed to have a negative impact on tax morale. However, the strength of the negative impact is very weak, constituting −0.005 and −0.007 for both OLS estimate and upper quantile, respectively. These imply that the tax morale behaviour of agrochemical traders is likely to be decreased by 0.005 from the OLS estimate and 0.007 at the upper quantile when the level of sanctions imposed by tax officers is rising to a particular point. In terms of significant check, the lower quantile (0.05) value yielded 1% significance, statistically. The results agree with Hofmann, Gangl, Kirchler, and Stark (2014), who asserted that high coercive power increases the willingness to pay tax forcefully. Gitonga and Memba (2018) revealed that sanctions such as harsh penalties motivate compliance to tax amongst transport savings and credit cooperative societies in Kenya. Sanction and lockdown are characteristics of power executable by tax authorities, which positively influence tax compliance (Inasius, 2019a, b).

Tax knowledge positively influences tax morale. The implication is that the tax morale behaviour of individuals is expected to increase when the tax knowledge of the individual increases. In addition, the OLS estimate, the lower quantile and the 0.25 quantile were statistically significant at 5%, 1% and 10%, respectively. This is broadly in line with Inasius (2015) and Inasius (2019a, b), who concluded that tax compliance increases as the tax knowledge of the taxpayer increases. The results also confirm the findings of

Gitonga and Memba (2018), who revealed that tax compliance amongst transport savings and credit cooperative societies are likely to be motivated by tax knowledge.

Generally, the factors of sanctions, lockdown and tax knowledge significance reaffirm the economic deterrence theory used as the theoretical framework underpinning this work. The results suggest that the power perceived to be wielded by the tax authorities to enforce the consequences of tax evasion positively influences the tax morale of agrochemical traders.

5. Conclusion

The analysis revealed that traders' tax knowledge is influenced by tax reporting, calculating and payment knowledge. Period for filling tax returns, revenue and expenditure to be reported, proper records keeping and the deadline for submission were information that contributed to the tax reporting knowledge of traders. Payment deadlines, penalty charges and payment plans contributed to tax payment knowledge, while information on the tax credit, withholding tax and drawings contributed to tax calculation knowledge. Again, it was observed that the general impact of factors from the lower to median quartiles of tax morale amongst traders differs from those with high tax morale. Religion is a vital factor across all quantiles. Age is found to have an impact on both lower and higher quantiles. The lower quantile was affected by gender, job performance and perception of the job of tax officers (power and trust), whereas the lower to low quantiles were mainly impacted by education and tax knowledge. Moreover, the results of the impact of the power of authorities on tax morale show that taxpayers' willingness to pay tax is influenced by the cost of evading, confirming the economic deterrence theory.

5.1 Policy implication

Tax knowledge positively affects the tax morale of traders; hence, it is recommended that the government includes in company registration protocols that owners of businesses undergo tax training for a week or two before a certificate for incorporation is issued, including annual mandatory training to reflect on changes in taxation.

5.2 Theoretical implication

The study revealed that tax authorities' power to increase the level of sanction positively influences taxpayers' tax morale. This result reaffirms the economic deterrence theory in the agrochemical sector. The study also has revealed that the combination of the precepts of the theory, in addition to socioeconomic, job performance and perception of tax officers' integrity explains the tax morale of traders.

5.3 Managerial implication

First and foremost, tax authorities' power influences the tax morale of traders; hence, tax officers are recommended to use their power legitimately and not in an abusive manner. Again, tax officers should apply sanctions correctly to yield effective results (influencing tax morale). Furthermore, tax officers could embark on open-house training, which allows tax officers to train agrochemical dealers on tax implication, computation, reporting and payment advice at no cost to the beneficiaries.

5.4 Limitations and future studies

This study did not assess tax compliance amongst agrochemical traders; as such, a future study is needed to confirm the assumption that the tax morale of agrochemical players influences their compliance in the agribusiness sector. Such studies could consider other control variables that could affect agrochemical traders' tax compliance apart from what has been used in this study.

Note

1. It is a moral obligation to contribute to society other than economic or fiscal motivations that encourages individual to pay taxes (Luttmer *et al.*, 2014; Cummings, Martinez-Vazquez, McKee, & Torgler, 2005).

REFERENCES

Abdul–Razak, A., & Adafula, C. J. (2013). Evaluating taxpayers' attitude and its influence on tax compliance decisions in Tamale, Ghana. *Journal of Accounting and Taxation*, 5(3), 48–57.

Acheampong, O., Debrah, O., & Yeboah, I. O. (2016). An assessment of tax compliance level of small enterprises in Ghana. *European Journal of Business and Management*, 8(12), 81–89.

Adiasa. (2013). Influence understanding tax regulations against taxpayer compliance with moderating risk preferences. *Accounting Analysis Journal*. Available from: http://journal.unnes.ac.id/sju/index.php/aaj

Adu, K. O., & Amponsah, S. (2020). Correlates of tax registration compliance among self-employed in Denkyira corridor of Ghana. *International Journal of Law and Management*, 62(4), 365–379.

Agbetunde, L. A., Raimi, L., & Akinrinola, O. O. (2022). Moderating influence of religiosity on the causality between taxpaying attitudes and tax compliance behaviour of entrepreneurial firms in Nigeria. *International Journal of Ethics and Systems*, 38(3), 402–425.

Agyei, A., & Gyamerah, S. (2014). The awareness of employees on tax relief scheme in Ghana. *International Business and Management*, 9(1), 79–83.

Al-Ttaffi, L. H. A., Bin-Nashwan, S. A., & Amrah, M. R. (2020). The influence of tax knowledge on tax compliance behaviour: A case of Yemeni individual taxpayers. *Journal of Business Management and Accounting*, 10(2), 15–30.

Alasfour, F., Samy, M., & Bampton, R. (2016). The determinants of tax morale and tax compliance: Evidence from Jordan. In *Advances in taxation*. Emerald Group Publishing.

Alm, J., & McClellan, C. (2012). Tax morale and tax compliance from the firm's perspective. *Kyklos*, 65(1), 1–17.

Alm, J., & Torgler, B. (2011). Do ethics matter? Tax compliance and morality. *Journal of Business Ethics*, 101(4), 635–651.

Amamoo, L. (2020). *Taxing the informal sector – the case of the vehicle income tax and tax stamp system in Ghana*. Kigalipapers.

Armah-Attoh, D., & Awal, M. (2013). Tax administration in Ghana: Perceived institutional challenges. *Afrobarometer Briefing Paper*, 124(1), 1–9. Available from https://www.afrobarometer.org/wp-content/uploads/migrated/files/publications/Briefing%20paper/afrobriefno124.pdf (accessed 24 January 2022).

Atawodi, O. W., & Ojeka, S. (2012). Factors that affect tax compliance among small and medium enterprises (SMEs) in North Central Nigeria. *International Journal of Business and Management*, 7(12), 87–96.

Baba, S. A., & Asante, S. (2012). Sanctions: Panacea for income tax non-compliance among Ghanaian self-employed. *European Journal of Business and Management*, 4(7), 121–129.

Bannor, R. K., Ros-Tonen, M. A., Mensah, P. O., Derkyi, M., & Nassah, V. F. (2021). Entrepreneurial behaviour among non-timber forest product-growing farmers in Ghana: An analysis in support of a reforestation policy. *Forest Policy and Economics*, 122, 102331.

Becker, G. S. (1968). Crime and punishment: An economic approach. In *The economic dimensions of crime* (pp. 13–68). London: Palgrave Macmillan.

Bedi, I. (2016). The influence of tax audit on tax compliance in Ghana. *International Journal of Management Practice*, 9(2), 132–141.

Bejaković, P., & Bezeredi, S. (2019). Determinants of tax morale in Croatia: An ordered Logit Model. *Business Systems Research: International Journal of the Society for Advancing Innovation and Research in Economy*, 10(2), 37–48.

Bilgin, C. (2014). Determinants of tax morale in Spain and Turkey: An empirical analysis. *European Journal of Government and Economics*, 3(1), 60–74.

Carrillo, P. E., Castro, E., & Scartascini, C. (2021). Public good provision and property tax compliance: Evidence from a natural experiment. *Journal of Public Economics*, 198, 104422. doi:10.1016/j.jpubeco.2021.104422.

Carroll, E. (2011). Taxing Ghana's informal sector: The experience of women. *Occasional Paper*, 7, 1–17. Available from https://www.christianaid.org.uk/sites/default/files/2022-07/taxing-ghana-informal-sector-november-2011.pdf (accessed 2 January 2022).

Carsamer, E., & Abbam, A. (2020). Religion and tax compliance among SMEs in Ghana. *Journal of Financial Crime*, (ahead-of-print).

Chawla, D., & Sondhi, N. (2011). *Research methodology: Concepts and cases*. New Delhi: Vikas Publishing House.

Crnogorac, M., & Lago-Peñas, S. (2020). Determinants of tax morale in former Yugoslavian countries. *Eastern European Economics*, 58(2), 174–196.

Cummings, R. G., Martinez-Vazquez, J., McKee, M., & Torgler, B. (2005). Effects of tax morale on tax compliance: Experimental and survey evidence (No. 2005-29). CREMA Working Paper.

Cyan, M. R., Koumpias, A. M., & Martinez-Vazquez, J. (2016). The determinants of tax morale in Pakistan. *Journal of Asian Economics*, 47, 23–34.

Damajanti, A., & Karim, A. (2017). Effect of tax knowledge on individual taxpayers' compliance. *Economics and Business Solutions Journal*, 1(1), 1–19.

Danso-Abbeam, G., & Baiyegunhi, L.J.S. (2017). Adoption of agrochemical management practices among smallholder cocoa farmers in Ghana. *African Journal of Science, Technology, Innovation and Development*, 9(6), 717–728.

Daude, C., Gutiérrez, H., & Melguizo, Á. (2012). What drives tax morale?.

Daude, C., Gutierrez, H., & Melguizo, A. (2013). What drives tax morale? A focus on emerging economies. *Review of Public Economics*, 207(4), 9–40.

de Winter, J.C., Dodou, D.I.M.I.T.R.A., & Wieringa, P.A. (2009). Exploratory factor analysis with small sample sizes. *Multivariate Behavioral Research*, 44(2), 147–181.

Denkyirah, E. K., Okoffo, E. D., Adu, D. T., Aziz, A. A., Ofori, A., & Denkyirah, E.K. (2016). Modeling Ghanaian cocoa farmers' decision to use pesticide and frequency of application: The case of Brong Ahafo Region. *SpringerPlus*, 5(1), 1–17.

Diarra, A., & Tasie, O. (2017). National implementation of regional pesticide policies in west Africa: Ghana case study report (No. 1879-2017-5325).

Doerrenberg, P., & Peichl, A. (2013). Progressive taxation and tax morale. *Public Choice*, 155(3), 293–316.

Dumortier, J., & Elobeid, A. (2021). Effects of a carbon tax in the United States on agricultural markets and carbon emissions from land-use change. *Land Use Policy*, 103, 105320.

Fatas, E., Nosenzo, D., Sefton, M., & Zizzo, D. J. (2021). A self-funding reward mechanism for tax compliance. *Journal of Economic Psychology*, 86, 102421. doi:10.1016/j.joep.2021.102421.

Fianko, J. R., Donkor, A., Lowor, S. T., & Yeboah, P. O. (2011). Agrochemicals and the Ghanaian environment, a review. *Journal of Environmental Protection*, 2(03), 221.

Filippin, A., Fiorio, C. V., & Viviano, E. (2013). The effect of tax enforcement on tax morale. *European Journal of Political Economy*, Elsevier, 32, 320–31, doi: 10.1016/j.ejpoleco.2013.09.005.

Gangl, K., Hofmann, E., & Kirchler, E. (2015). Tax authorities' interaction with taxpayers: A conception of compliance in social dilemmas by power and trust. *New Ideas in Psychology*, 37, 13–23.

Gatsi, J. G., Gadzo, S. G., & Kportorgbi, H. K. (2013). The effect of corporate income tax on financial performance of listed manufacturing firms in Ghana. *Research Journal of Finance and Accounting*, 4(15), 118–124.

Ghana Statistical Services. (2014). *Ghana statistical services: District analytical report*. Ghana: Government of Ghana (GoG), Sunyani Municipality.

Gitonga, G. N., & Memba, F. (2018). Determinants of tax compliance by public transport savings and credit cooperative societies in Kenya: A case study of Kiambu county.

Gujarati, D. (2015). *Econometrics by example* (2nd ed.). New York: Palgrave Macmillan.

Halla, M. (2012). Tax morale and compliance behaviour: First evidence on a causal link. *The B.E. Journal of Economic Analysis & Policy*, De Gruyter, *12*(1), 1–27, doi: 10.1515/1935-1682.3165.

Hill, B., & Blandford, D. (2007). Taxation concessions as instruments of agricultural policy (No. 349-2016-17918).

Hofmann, E., Gangl, K., Kirchler, E., & Stark, J. (2014). Enhancing tax compliance through coercive and legitimate power of tax authorities by concurrently diminishing or facilitating trust in tax authorities. *Law and Policy*, *36*(3), 290–313.

Hug, S., & Spörri, F. (2011). Referendums, trust, and tax evasion. *European Journal of Political Economy*, *27*(1), 120–131.

Inasius, F. (2015). Tax compliance of small and medium enterprises: Evidence from Indonesia. *Accounting and Taxation*, *7*(1), 67–73.

Inasius, F. (2019a). Factors influencing SME tax compliance: Evidence from Indonesia. *International Journal of Public Administration*, *42*(5), 367–379.

Inasius, F. (2019b). Voluntary and enforced tax compliance: Evidence from small and medium- sized enterprises in Indonesia. In *Advances in Taxation*. Emerald Publishing.

Income Tax Act. (2015). Income tax act, 2015 (Act 896). Available from: https://www.bcp.gov.gh/acc/registry/docs/TAX%20896-INCOME%20TAX%20ACT,%202015%20(ACT%20896)%20AS%20AMENDED%20BY%20ACTS%20902,%20907,%20915,%20924,%20941,%20956,%20967%20AND%20973.pdf (accessed 1 January 2022).

Internal Revenue Act. (2000). Internal revenue act (Act 592, 2000). Available from: http://www.e-agriculture.gov.gh/index.php/policies/82-internal-revenue-act-act-592-2000 (accessed 1 January 2022).

Kirchler, E., Hoelzl, E., & Wahl, I. (2008). Enforced versus voluntary tax compliance: The 'slippery slope' framework. *Journal of Economic Psychology*, *29*(2), 210–225.

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.

Lago-Peñas, I., & Lago-Peñas, S. (2010). The determinants of tax morale in comparative perspective: Evidence from European countries. *European Journal of Political Economy*, *26*(4), 441–453.

Lee, N. (2017). Can territorial tax compliance systems reduce the tax avoidance of firms with operations in tax havens? *Emerging Markets Finance and Trade*, *53*(4), 968–985.

Lisi, G. (2019). Slippery slope framework, tax morale and tax compliance: A theoretical integration and an empirical assessment. *Discussion Papers in Economic Behaviour*, *2*, 19.

Lumumba, M., Migwi, S. W., & Magutu, O. (2010). Taxpayers' attitudes and tax compliance behaviour in Kenya (How the taxpayers attitudes influence compliance behaviour among SMEs Business Income Earners).

Luttmer, E. F., & Singhal, M. (2014). Tax morale. *Journal of Economic Perspectives*, *28*(4), 149–68.

Mas'ud, A., Aliyu, A. A., Gambo, E. J., Al-Qudah, A. A., & Al Sharari, N. (2014). Tax rate and tax compliance in Africa. *European Journal of Accounting Auditing and Finance Research*, *2*(3), 22–30.

Mensah, N. O., Amrago, E. C., Asare, J. K., Tutu, F. O., & Donkor, A. (2020). Poultry farmers willingness to pay for agricultural tax: Evidence from the Bono region, Ghana. *World Journal of Entrepreneurship, Management and Sustainable Development*.

MOFA. (2003). *Agriculture in Ghana: Facts and figures, Accra: Produced by the statistics*. Research and Information Directorate.

Muazu, I., Musah, A., & Abdul-Hanan, A. (2015), Beyond enforcement: What drives tax morale in Ghana? *Humanomics*, *31*(4), 399–414, doi: 10.1108/H-04-2015-0023.

Muehlbacher, S., Kirchler, E., & Schwarzenberger, H. (2011). Voluntary versus enforced tax compliance: Empirical evidence for the 'slippery slope' framework. *European Journal of Law and Economics*, *32*(1), 89–97.

Nagel, H., Huber, L. R., Van Praag, M., & Goslinga, S. (2019). The effect of a tax training program on tax compliance and business outcomes of starting entrepreneurs: Evidence from a field experiment. *Journal of Business Venturing*, *34*(2), 261–283.

Nichita, R. (2015). *Is tax literacy impacting on tax behavior? Collaboration in complex system*. Bucharest: Romanian Foundation for Business Intelligence Seaopenresearch. Available from: http://seaopenresearch.eu/Proceedings/Article/NORD2_5.pdf (accessed 7 December 2018).

Oladipo, O.A., Iyoha, F., Fakile, S.A., Asaleye, A.J., & Eluyela, F.D. (2019). Tax revenue and agricultural performance: Evidence from Nigeria. *Business Perspectives*, *17*(3), 342–349.

Oladipupo, A. O., & Obazee, U. (2016). Tax knowledge, penalties and tax compliance in small and medium scale enterprises in Nigeria. *IBusiness*, *8*(1), 1–9.

Opoku, P. D., Bannor, R. K., & Oppong-Kyeremeh, H. (2020). Examining the willingness to produce organic vegetables in the Bono and Ahafo regions of Ghana. *International Journal of Social Economics*.

Osei, M. K., Osei, K., Braimah, H., Mochiah, M. B., Berchie, J. N., Bolfrey-Arku, G., & Lamptey, J. N. (2013). Practices and constraints to cabbage production in urban and peri-urban Ghana: Focus on Brong Ahafo and Ashanti regions. *Journal of Agricultural Science*, *2*(1), 05–14, ISSN 2315-6880.

Palil, M. R., & Mustapha, A. F. (2011). Factors affecting tax compliance behaviour in self-assessment system. *African Journal of Business Management*, *5*(33), 12864–12872.

Ristovska, M., Mojsoska-Blazevski, N., & Nikolov, M. (2013). An alternative view to the tax evasion: the effect of tax morale on paying taxes in Macedonia and EU countries. *Serbian Journal of Management*, *8*(2), 169–183.

Rodriguez-Justicia, D., & Theilen, B. (2018). Education and tax morale. *Journal of Economic Psychology*, *64*, 18–48.

Saad, N. (2014). Tax knowledge, tax complexity and tax compliance: Taxpayers' view. *Procedia-Social and Behavioral Sciences*, *109*, 1069–1075.

Shi, H., & Ye, B. (2018). China's abolition of the agricultural tax, local governments' responses and economic growth. *Fiscal Studies*, *39*(3), 517–542.

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.

Terkper, S. (2013). *Ghana's energy crisis to impede 2013 domestic revenue mobilisation*. Joy News. Available from: www.myjoyonline.com/pages/news/201304/103901.php

Torgler, B. (2005). Tax morale and direct democracy. *European Journal of Political Economy*, *21*(2), 525–531.

Torgler, B. (2012). Tax morale, eastern Europe and European enlargement. *Communist and Post-Communist Studies*, *45*(1-2), 11–25.

Torgler, B., Schaffner, M., & Macintyre, A. (2007). Tax compliance, tax morale and governance quality (No. 2007-17). CREMA Working Paper.

Wang, X., & Shen, Y. (2014). The effect of China's agricultural tax abolition on rural families' incomes and production. *China Economic Review*, *29*, 185–199.

Williams, C. C., & Krasniqi, B. (2017). Evaluating the individual-and country-level variations in tax morale: Evidence from 35 Eurasian countries. *Journal of Economic Studies*.

World Bank. (2017). *Fiscal consolidation to accelerate growth and support inclusive development: Ghana public expenditure review* (pp. 1–155). World Bank.

Yew, B., Milanov, V., & McGee, R. W. (2015). An analysis of individual tax morale for Russia: Before and after flat tax reform. *International Business Research*, 8(1), 60–80.

Yusof, N. A. M., Ling, L. M., & Wah, Y. B. (2014). Tax non-compliance among SMCs in Malaysia: tax audit evidence. *Journal of Applied Accounting Research*, 15(2), 215–234. doi:10.1108/JAAR-02-2013-0016.

Appendix

Variables	Definition	Values	Expected sign	Relevant literature
Dependents				
Model 1				
Tax morale (TM)	A continuous variable that estimates the level of tax morale of respondents	Respondents' scores from 10 questions relating to tax morale		
Model 2				
OLS	A continuous variable that estimates the level of tax morale of respondents	Cumulative scores of respondents from 10 questions relating to tax morale		
Tax morale (TM)				
Independent				
Age	Continuous variable indicating the exact age of respondents	The actual age of respondents in years	+	Daude *et al.* (2013), Ristovska *et al.* (2013), William and Krasniqi (2017), Alasfour *et al.* (2016)
Gender	A dummy variable showing the sex type of the respondent	0 = male 1 = female	+/−	Torgler (2012) Cyan *et al.* (2016), Bejaković and Bezeredi (2019)
Marital status	Categorical variable indicating the marital status of the respondents	1 = single 2 = divorced	+/−	Torgler (2005), Hug and Sporri (2011), Torgler (2012)
Level of education	Categorical variable showing the level of the respondents' education	Respondents' education in school (years)	+/−	Torgler *et al.* (2007), Muazu *et al.* (2015), Cyan *et al.* (2016), Crnogorac and Lago-Peñas (2020)
Number of awards	Continuous variable revealing the number of awards won	Number of awards received	+	Carrillo *et al.* (2021), Fatas *et al.* (2021)
Work experience	Continuous variable showing the number of years worked by the respondents	Number of years worked	+/−	Kirchler *et al.* (2008), Gangl *et al.* (2015)
Religion	Categorical variable providing information on the type of religion the respondents belong to	1 = none 2 = Islamic 3 = Christianity	+	Doerrenberg & Peichl (2013), Bilgin (2014), Crnogorac and Lago-Peñas (2020)

Table A1.
Description of variables employed in the regression analysis

Variables	Definition	Values	Expected sign	Relevant literature
Christian denomination	Categorical variable	1 = charismatic 2 = orthodox	−	Alm and McClellan (2012)
Business size	Categorical variable indicating the size of the respondents' firm	In between 2 and 3 employees = medium Above 3 employees = large		
Monthly sales	Continuous variable indicating the respondents' sales per month in Ghana Cedis	Number of sales per month in Ghana Cedis	+/−	Yusof *et al.* (2014), Yew *et al.* (2015), Bedi (2016)
Respect	Interval scale variable showing the magnitude of agreement or disagreement by the respondents on voluntary payment of tax due to the respect shown by tax collectors	1 = totally disagree 2 = disagree 3 = neither agree nor disagree 4 = agree 5 = totally agree	+	Inasius (2019)
Honest	Interval scale variable indicating the magnitude of agreement or disagreement by the respondents on voluntary payment of tax due to the honest character of the tax collectors	1 = totally disagree 2 = disagree 3 = neither agree nor disagree 4 = agree 5 = totally agree	+	Hofmann *et al.* (2014)
Trustworthy	Interval scale variable showing the magnitude of agreement or disagreement by the respondents on voluntary payment of tax based on the trustworthiness of tax collectors	1 = totally disagree 2 = disagree 3 = neither agree nor disagree 4 = agree 5 = totally agree	+	Kogler *et al.* (2013)
Expertise	Interval scale variable indicating the magnitude of agreement or disagreement by the respondents on voluntary compliance if tax collectors are experts in detecting tax evaders	1 = totally disagree 2 = disagree 3 = neither agree nor disagree 4 = agree 5 = totally agree	+	Hofmann *et al.* (2014)
Lockdown	Interval scale variable showing the magnitude of agreement or disagreement by the respondents on complying to tax if tax collectors lock down their firms	1 = totally disagree 2 = disagree 3 = neither agree nor disagree 4 = agree 5 = totally agree	+	Muehlbacher *et al.* (2011)

(*continued*)

Table A1.

Variables	Definition	Values	Expected sign	Relevant literature
Sanction	Interval scale variable indicating the magnitude of agreement or disagreement by the respondents on complying to tax if they are sanctioned by tax collectors for non-compliance	1 = totally disagree 2 = disagree 3 = neither agree nor disagree 4 = agree 5 = totally agree	+	Kogler *et al.* (2014)
Tax knowledge	Interval scale variable indicating the level of the respondents' tax knowledge	0 = low 1 = average 2 = High	+	Inasius (2015)

Table A1.

Corresponding author
Richard Kwasi Bannor can be contacted at: richard.bannor@uenr.edu.gh