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# Journal of Accounting and Taxation

Table of Contents: Volume 10 Number 4 June 2018

## ARTICLE

**Determinants of tax evasion in the developing economies: A structural equation model approach of the case of Ghana**

**37**

Richard Oduro, Michael Amoh Asiedu and George Tackie

*Full Length Research Paper*

# **Determinants of tax evasion in the developing economies: A structural equation model approach of the case of Ghana**

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**The objective of this paper is to examine the factors that determine whether a tax payer would evade tax. It also seeks to explore the mediating role of tax education in the relationship between traditional, institutional, socio-cultural factors and tax evasion. A cross-sectional survey was used for the study. Using structural equation modelling with bootstrapping analysis, data from a sample of 1,052 tax payers, drawn from different parts of the country, was analysed and the result showed that, traditional factors and institutional factors positively influenced tax evasion; though the strength of the relationship is weak. This relationship was also found to be mediated by tax education as it relate negatively with traditional and institutional factors as well as tax evasion. It was also found that, socio-cultural factors such as gender, income level, education and age do not have significant influence on tax evasion. The study concluded that, tax education plays a significant role in reducing the effect of traditional and institutional factors on tax evasion. The study recommended that educating respondents on the need to pay taxes moderate the extent to which increases in tax rates, penalty for tax non-compliance, and audit probability contributes to tax evasion. It was again recommended that, high cost of compliance and high corruption level of tax officials would lead to increase in tax evasion, but intensive tax education mediating the effect of these factors on tax evasion.**

**Key words:** Tax evasion, tax rate, tax education, audit probability, structural equation modelling.

## **INTRODUCTION**

Ghana loses about \$2.1 billion tax revenue annually due to tax evasion activities of tax payers (ISODEC, 2016). This seems to be the continuing trend since 1970 which in effect reduces government revenue, increases the taxes that compliant taxpayers face and often reduces

the public services that citizens receive. For example, for the 2013 fiscal year, only 1.5 million tax payers out of the estimated taxable population of 6 million pay direct taxes (Ghana, 2013). This represents a significant percentage of 75% rates of evasion.

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Tax evasion has generated huge international concerns for tax authorities and policy makers as tax evasion seriously threatens the capacity of governments to raise public revenue (Gerald et al., 2009). Developing and emerging economies like Ghana are vulnerable to tax evasion and tax avoidance activities of individual and corporate taxpayers, as the tax losses arising in the course of tax evasion, and avoidance activities do largely contribute to the poor performance of the state revenue mobilization in these countries (GIZ, 2010).

Over the last three decades, tax evasion has been given a big emphasis by researchers because of increasing non-compliance especially tax evasion and its consequences on the capacity of government in raising public revenue. However most of these studies are done in developed economies (Clotfelter, 1983; Klovland, 1984; Schneider et al., 2008) with a limited number focused on developing countries. Very few studies discuss the subject matter in the developing countries such as Ameyaw and Dzaka (2016) and Ameyaw et al. (2015). Although non-compliance by tax payers is a continual and global problem, many indicators suggest that developing countries in sub-Saharan Africa have had the hardest hit (Annan et al., 2010).

Tax research in Ghana, like many other developing countries, seems to focus greater attention on the twin issues; tax administrative reforms and reduction of corruption (Richard, 2003). For example, Terkper (2007) explored ways of improving the tax accounting systems of SME's in Ghana while Ayee (2007) discussed strategies for achieving compliance through building and improving reciprocity with government. The study by Atuguba (2006) profiled the tax culture of Ghanaians.

On determinants of tax evasion, Ameyaw and Dzaka (2016) outlined fiscal factors, demographic factors, administrative factors and economic factors as the main factors that have a significant effect on the evasion of taxes in Ghana, using factor analysis. These studies however fell short of examining specific attitudinal antecedents of tax-paying behaviour and the role of tax education in reducing tax evasion. This study therefore is meant to fill the gap by identifying the factors that account for tax evasion in Ghana, using Structural Equation Modelling as the main statistical tool.

This study is essential as it would benefit policy makers and tax authorities, as it looks at how some variables such as income level, tax fines and penalties and perception on government spending can influence taxpayer's evasion behaviour and its effects on Ghana's total tax revenue.

## LITERATURE REVIEW

Several studies have been carried out in the literature to find out the key factors that motivate tax payers to evade tax, both in the developed (Thomas, 2015; Crane and Farrokh, 1990) and in the developing economies

(Muhammed et al., 2012; Annan et al., 2010).

From these studies, reasons such as incidence of tax, income level, sources of income, tax audits, tax rates, penalties, gender, marital status, fairness of the tax system, tax mentality, and tax morale are the factors identified as the main influencer of evasion of taxes. Other recent studies in the developing economies (Ameyaw et al., 2016), has attempted to group these reasons and find out how these groupings, collectively, may be a key motivator of tax evasion in Ghana. This study, in a similar manner, grouped these reasons into three major factors (traditional, institutional and socio-cultural) moderated by the education level of the tax payer to determine the extent to which these factors collectively leads to tax evasion. We therefore reviewed related literature in relation to these factors.

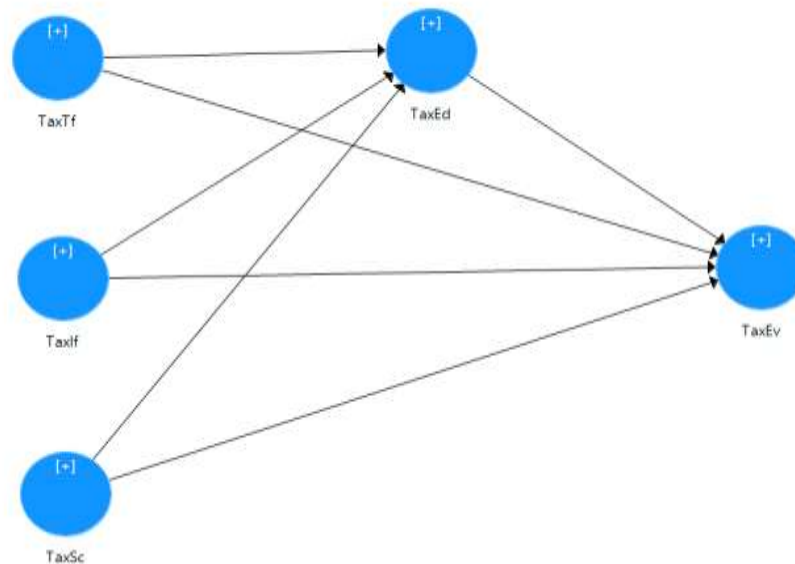
Tax evasion is any action of tax payers that results in the concealment of all or part of the tax payers' legitimate or illegitimate economic activities from tax authorities in order to escape payment of taxes. It is distinguished from tax avoidance which is legal but is against the spirit of the law and tax planning which is within both the spirit and legal confines of the law. In this study, the chance of tax payers evading tax was assessed on the bases of fairness of the tax system, complexity of the tax system and usage of tax revenue by the government. Several studies has been undertaken to assess the magnitude of tax evasion in this direction.

On fairness of the tax system, Richardson (2006) and Coskun (2009) argue that, the tendency of tax payers to evade tax is dependent on the extent to which the tax payers perceive a tax system to be fair. Alm (2011) also held a similar argument and indicated that, the perceived fairness of tax system significantly influence the tax payer to evade tax.

On complexity of the tax system, Jackson et al. (1986) contended that, the complexity of tax system has been considered as one major reason for tax non-compliance. Terkper (2007) confirmed this by advancing reasons such as lack of understanding of the tax laws as being one of the leading bases for which tax payers do not comply with the tax law.

In an attempt to provide a way out, Young et al. (2013) concluded that, the tax rules should be simple, clear and comprehensible to allow taxpayers to read and understand what they are required of and the rules they need to follow easily and quickly. This would reduce the extent of tax evasion. Linking complexity to fairness of tax system, Beck et al. (1991) concurred with the view that, reducing tax complexity may lead to an increased perception of fairness on tax system and subsequent reduction of tax non-compliance. These clearly shows that the literature support the fact that, there is a significant inverse relationship between complexity of the tax law and fairness of the tax system.

Several studies have been conducted to investigate the factors that contribute to tax evasion in Ghana, notable



**Figure 1.** A hypothesised tax evasion model.

among them being Ameyaw et al. (2016), Annan et al. (2010) and Agyei (1984). To our knowledge, it is evident that these studies have investigated these factors independently with only few which have combined the factors into a truly multidisciplinary study. This paper proposes to overcome this research gap, and makes a contribution to the tax literature by investigating the factors that influence tax evasion using a Structural Equation Modelling (SEM) approach.

### Model development and study hypotheses

In developing a model for the study, five constructs were used: tax evasion (TaxEv) which is considered as endogenous latent variable, tax education (TaxEd) as moderating variables and traditional factors (TaxTf), institutional factors (TaxIf) and socio-cultural factors (TaxSc) which are all exogenous variables. The proposed relationship between these variables is shown by the path diagram in Figure 1.

#### Effect of traditional factors on tax evasion

Traditional factors considered in this study are tax rate, penalty rate and audit probability. Empirical studies have shown that, there is a positive relationship among tax rate, penalty rates, audit probability and tax evasion as evidenced in the studies by Allingham et al. (1972) and Slemrod et al. (2000).

For the purpose of this study, these reasons have been grouped under traditional factors. Tax rates, in the literature, have been widely recognized as one of

the most primary determinant of tax evasion. Tanzi (1983) provides an empirical evidence on the impact of tax rates on tax evasion and concluded that the tax rate – evasion experience varies in results from neutral effect to significantly positive and negative effect. In contrast to this view, some studies (Slemrod et al., 2000; Allingham et al., 1972) including most recent studies (Ameyaw et al., 2016) have concluded that there exists a statistically significant positive effect of tax rates on tax evasion.

Assessing the effect of tax rate on tax evasion, Clotfelter (1983) claimed that reducing tax rates is not the only policy that has the potential to discourage tax evasion, but is also an important factor in determining tax compliance behaviour, although the exact impact is still unclear and debatable (Kirchler, 2007). Clotfelter (1983) also suggests that there was a significant positive relationship between tax rates and tax evasion due to tax rates being used as an instrument that can be manipulated for policy goals in particular.

Several studies have also confirmed the assertion by Clotfelter claiming that, raising marginal tax rates will encourage taxpayers to evade tax (Whitte et al., 1985; Ali et al., 2001; Torgler, 2007); while lowering tax rates does not necessarily increase tax compliance (Trivedi et al., 2004; Kirchler, 2007). This uncertainty and conflicting issue (for example reducing tax rate to increase compliance) has attracted the attention of tax researchers aiming to come up with more certain and concrete evidence of the impact of tax rates on evasion.

On tax penalties and tax evasion, it is widely accepted that increase in money cost of tax evaders is a deterrent force to reduce tax evasion. Empirical studies on the relationship between tax penalties and tax evasion also ranges from statistically no effect to a significant effect.



A study by Allingham et al. (1972) asserted that there is no significant relationship existing amongst tax evasion, tax penalties and detection probability. This was confirmed by Spicer et al. (1976) who also captured no effects between tax evasion and tax penalties. However, a study by Bagdigen et al. (2010) concluded that, a potential increment in penalties resulting from tax evasion connote a corresponding decrease in taxpayers potential tax-evading behaviours, indicating that, there is at least some level of relationship between tax evasion and tax penalties.

Park et al. (2003) in their experimental study of determinant of tax compliance using data for Korea, discover that charging taxpayers penalty when caught encouraged tax payers to report the actual income they earn. This therefore postulates a positive relationship between tax evasion and tax penalty. On audit probability, a study by Allingham et al. (1972) showed a direct relationship between tax audits and the tendency of taxpayers evading taxes. The same relationship cannot be concluded in the context of developing economies such as Ghana, hence merits a study into the relationship. On this basis the following hypothesis can be formulated;

*H1: There is a positive relationship between the traditional factors and tax evasion.*

### **Institutional factors and tax evasion**

For the purpose of this study, institutional factors refers to those factors that are inherent with the Ghana tax system and hence likely to relate to tax evasion. For this study, institutional factors comprise of two indicators, namely, level of tax compliance of the tax system and level of corruption in the tax system.

The relationship between tax evasion and corruption is motivated by several empirical findings. Graetz et al. (1985) and Skinner et al. (1985) among others, have empirically estimated the compliance rates given a level of corruption in various countries and have found them significantly higher than expected, taking into account the auditing probabilities and fines. Theory does not provide a clear answer about the relationship between corruption of tax officials and the degree of compliance. However, empirical studies shows that, the dept of corruption in the tax system determines the extent of tax evasion (Ivanova et al., 2005) suggesting a positive relationship between corruption and tax evasion.

Also, studies by Tanzi et al. (1997) and Friedman et al. (2000), for example, have provided evidence that countries with more corruption tend in their tax system to collect fewer tax revenues in relation to gross domestic product (GDP), all else being equal showing high tax evasion rate. On this basis, we can formulate another hypothesis as follows;

*H2: There is a positive relationship between the institutional factors and tax evasion.*

### **Socio-cultural factors and tax evasion**

Socio-cultural factor, for the purpose of this study, is defined as the attributes of tax payers that may contribute to tax evasion. These include age, marital status, education, gender and level of income of the tax payer.

The effect of socio-cultural factors on tax evasion has a mixed result in the literature. Some studies provide empirical evidence of a significant relationship between socio-cultural factors and tax evasion, whereas other studies do not find a significant relationship.

For instance, McGee and Tyler (2006) finds that individuals who are 65 years or older are less likely to evade taxes and that married individuals are more likely to evade taxes. The study also stresses the fact that tax evasion is more of an unacceptable behaviour for female taxpayers than for male taxpayers. Spicer and Becker (1980) also show that male taxpayers are more likely to evade taxes more than female taxpayers.

On the basis of theoretical and empirical study, an increase in income may lead to increases or decreases in tax evasion. Embaye (2007) investigated the relationship between income and tax evasion in South Africa and showed that the relationship between income and tax evasion is positive but statistically insignificant.

In summary, various socio-cultural factors contribute to or affect the tax-evading behaviour of taxpayers. However, the degree of each factor's effect on the tax-evading behaviour of taxpayers may differ due to differences in social and cultural settings. However, for the purpose of this study, we hypothesized a significant relationship between socio-cultural factors. On this basis, another hypothesis is stated as follows:

*H3: There is a significant relationship between socio-cultural factors and tax evasion.*

### **Role of tax education**

Drawing from the definition by Eriksen et al. (1996), IRB Annual Report (2006) and McKerchar (2007), we can loosely define tax education as any informal or formal programme instituted by the tax authority or independent interested agencies to facilitate taxpayers in comprehending the tax system and the application of the tax laws in completing tax returns correctly and also to cultivate awareness of their responsibilities in respect of the tax system. This definition seems to instil the high spirit of tax compliance among tax payers. The areas of tax education, according to IRS (2009), may be carried out through workshops or in-depth tax courses, instructors provided training on filing tax returns, starting

a business, recordkeeping, preparing business and personal tax returns, self-employment tax issues, and employment taxes.

In their study, Eriksen et al. (1996) drew a clear conclusion that, knowledge about tax laws plays a major role in determining taxpayers' compliance behaviour. Therefore, an increase in the level of tax education, to some extent, reduces the degree of tax evasion among tax payers. To this end, continuous education programmes and effective monitoring mechanisms must be taken into account by tax authorities to ensure that taxpayers have a good and reasonable knowledge and understanding of tax matters. Thus, as the level of tax education increases, we expect a fall in the level of tax evasion.

Similarly, increased tax education is expected to change tax payers' perception about tax rate, tax penalty and tax audit, hence, tax education as a mediating variable satisfies that conditions for a variable to be mediating (Baron et al., 1986). We therefore state the following hypotheses;

*H4: Tax education mediate the relationship between institutional factors, traditional factors, socio-cultural factors and tax evasion*

## METHODOLOGY

### Sampling and data collection method

A cross-sectional survey was applied during the study. A sample of 1,052 tax payers was selected from three metropolitan assemblies (Accra, Kumasi and Tamale), three municipal assemblies (Winneba, Sunyani and Bolga) and three district assemblies (Afigya-Kwabre, Shama and Keta).

Specifically, a total of 602 tax payers (representing 57% of the sample) were selected from the three metropolitan assemblies (201 from Accra, 201 from Kumasi and 200 from Tamale), 75 each were selected from the three municipal assemblies and 75 each from the three district assemblies.

A purposive sampling (where sampling units were selected based respondents known to pay or eligible to taxes in Ghana) was used to sample the participants for the study. This enabled the researchers to select respondents based on purpose for which the study was undertaken but was done under a controlled environment.

A questionnaire was the main data collection tool used in collecting the data for the study. The questions were developed on the basis of previous research and scale developing procedures. The research instrument was applied with the help of carefully selected well trained research assistants to administer the instrument to the respondents.

A total of 1,200 questionnaires were distributed to employees from the formal sector (constituting 40%); and self-employed from the informal sector (constituting 60%) who pay taxes from their income; and a total of 1,172 questionnaires were retrieved from the respondents.

However, after sorting and data cleaning exercise, we excluded 120 incomplete questionnaires, leaving 1,052 fully completed questionnaire representing 88% response rate of the sample. As far as possible, respondents were assured of their anonymity and confidentiality before the commencement of the data collection

exercise.

### Measurement of variables

The latent variables used for the study were measured using questionnaire with Likert scale type of items as the main instrument on the basis of previous research and scale developing procedures. The constructs concerning the scales were measured with multiple item-scales based on the related literature, and some were adopted from the literature and modified to suit the domain of the study.

#### *Tax Evasion (TaxEv)*

The measure of tax evasion was based on the scale developed by McGee (2005) but modified to suit the study objective. The scale for the study used, containing nine indicators, is made up of possible justification taxpayers advanced to evade tax. All the items of the tax evasion scale were measured based on a seven-point Likert scale from '*strongly disagree (=1)*' to '*strongly agree (=7)*'. The reliability coefficients for the total scale with nine indicators per the Cronbach's alpha indicate a high satisfactory levels for cut-off point of (0.70) described by Nunnally (1978). The total scale reliability was 0.975 indicating that, the model fits the data in respect of tax evasion.

#### *Tax Education (TaxEd)*

To develop a valid scale to measure perception of tax payers on tax education, we adopted a research framework based on the study by Churchill (1979) which was further developed in the study by DeVellis (2012). To assess the taxpayers' level of interest in being educated on tax matters, tax education was measured with five indicators developed by the authors. Tax education was considered as a moderating variable and it contained five indicators, which are made up of possible justification taxpayers' advance to evade tax owing to not being educated on tax issues. All the items on the tax education scale were measured based on a seven-point Likert scale, from '*strongly disagree (=1)*' to '*strongly agree (=7)*'. The reliability coefficients for the total scale of 0.87, indicating a high level of satisfaction for cut-off point of 0.70; hence the model fits the data in respect of tax education.

#### *Traditional factors (TaxTf)*

Traditional factors, for the purpose of this study, is made up of tax rate, penalty rate and audit probability. Items measuring these factors were made up of statements that justify tax evasion practices on the basis of these factors. To measure this variable, we adopted the semantic differential technique of Osgood et al. (1957). This scale asks respondents to rate certain acts they would have adopted to evade tax if they had the opportunity on the basis of bipolar adjectives, each representing a seven point scale. For the purpose of this study, three indicators of taxpayers' attitude based on finding a reason to evade tax are assessed. All the items were measured based on a seven-point Likert scale from '*strongly disagree (=1)*' to '*strongly agree (=7)*'. The reliability coefficients for the total scale 0.77.

#### *Institutional factors*

The methodology to measure tax compliance costs is the EU Standard Cost Model (EU SCM Methodology, 2009). The EU SCM is used in the study as benchmark against which to evaluate other

methodologies for measuring tax compliance costs. For the purpose of the study, the compliance cost was grouped into three in line with the EU SCM, that is, direct cost for business, indirect cost for business, and other cost. Compliance as a construct for institutional factor contained three basic indicators where tax payers were asked to confirm or not the cost they incurred in complying with a tax law. Similarly, measure of taxpayers' perception on corruption is based on four indicators obtained in line with the scale applied in the European Bank for Reconstruction and Development (EBRD) on some 3000 enterprises in 20 transition economies. The reliability of overall scale for institutional factor was 0.935.

### **Socio-cultural factors**

These were included in the hypothesised tax evasion model as a controlled variable as demographics of respondents might account for variation in taxpayers' decision to evade taxes intention (Embaye, 2007). Age, gender, education and income level of respondents in the tax evasion model were controlled. Age and income level of respondents were considered as continuous variables, gender was coded as 1 = male and 2 = female. Education level was coded as 1 = no formal education; 2 = primary/junior high; 3 – senior high; 4 – first degree; 5 – post first degree including professional qualification.

## **RESULTS AND DISCUSSION**

This section deals with the validation of the tools used in measuring the study variables, descriptive statistics, and inter-correlations among the study variables and hypothesis testing of the hypothesised model (Figure 1) using structural equation modelling. The data collected from the field was analysed using IBM SPSS version 20.0 for windows and Smart PLS version 3.2.6 (Ringle et al., 2015).

### **Demographic profile of respondents**

From the total sampled respondents, 49% (492 counts) were males and the rest of the sampled respondents were females. This result is due to a large sample drawn from the informal sector which is largely female dominated. The average age of the respondents was 40.08 years (SD = 12.91). The average years of respondents in employment or being self-employed is 9.2 year (SD = 0.725). It was however observed that, 58% of the sampled respondents have been in employment or in business operation above the average. The average taxable monthly income of the respondents was GHS1,898 (SD = 935.61) with 37% of the respondents earning above the average income. The proportion of respondents with senior high education or below was 62%; while only 7% of the respondents have had post first degree qualifications, though some respondents stated that, they had other professional qualifications. These results are consistent with the work of Ayee (2007) and Abubakari et al. (2013) who studied Building Tax Compliance through Reciprocity with Government and the taxpayers' attitude and its influence on compliance

decision in the northern part of Ghana respectively.

### **Confirmatory factor analysis (CFA)**

In order to test how well the data collected fits the hypothesized model (Figure 1) and also the reliability and validity of the measurement constructs, CFA was conducted.

### **Model fitness test**

Due to the sensitiveness of chi-square value to large samples, other fit indices such as standardized root mean square residual (SRMR), normed fit index (NFI), squared Euclidean distance (d\_LS), and root mean squared theta (RMS  $\theta$ ) were also considered to test model fitness on the data collected. Hu and Bentler (1999) recommended that SRMR of value less than 0.08 is considered good fit. It is also an indication that, the hypothesized model is specified (Henseler et al., 2014).

Bentler and Bonett (1980) asserted that, the NFI result in a value between 0 and 1, and that, the closer the NFI to 1, the better the fit. NFI valued above 0.9 represent acceptable fit. The d\_LS is based on bootstrap result of the exact model fit. The d\_LS fit indices measure the difference between the correlation matrix implied by the hypothesized model and the empirical correlation matrix, and such difference should be significant ( $p > 0.05$ ) to confirm the fitness of the measurement model (Dijkstra et al., 2015).

Also, the RMS  $\theta$  assess the extent to which the outer model residuals correlate and a measure close to zero indicate a good fit as this would imply a small correlation between the outer model residuals. RMS  $\theta$  value below 0.12 is therefore an indication of a well-fitting model, where higher values indicate lack of fit (Henseler et al., 2014) (Table 1).

Based on the data from a sample of 1,052 respondents, the results of the CFA show that the hypothesised five-factor hypothesized model (tax evasion predicted by traditional, institutional and socio-cultural factors moderated by tax education) had a better fit to the data. The ratio of  $\chi^2$  to degree of freedom was 3.93, SRMR = 0.032, NFI = 0.971 and RMS  $\theta$  = 0.34. Bootstrap result for d\_LS showed a probability of acceptance at 21.3%, indicating an insignificant difference between the correlation matrix implied by the hypothesized model and the empirical correlation matrix. All these indices indicate a superior model fit for the five – factor model to the alternative models as shown in Table 1.

### **Validity and reliability test**

CFA was again applied to test the validity and reliability of

**Table 1.** Fit indices for the hypothesis model.

| Model fit indices   | $\chi^2/df$ | SRMR           | NFI            | d_LS       | RMS $\theta$ |
|---|-------------|----------------|----------------|------------|--------------|
| Acceptable level  | (< 5)       | ( $\leq$ 0.08) | ( $\geq$ 0.90) | $p > 0.05$ | < 0.12       |
| Five-factor hypothesized model<br>(TaxEv, TaxEd, TaxTf, TaxIf, TaxSc)     | 3.93        | 0.032          | 0.971          | 0.213      | 0.34         |
| Four-factor hypothesized model<br>(TaxEv, TaxEd, TaxTf + TaxIf, TaxSc)    | 4.28        | 0.142          | 0.082          | 0.105      | 0.377        |
| Four -factor hypothesized model<br>(TaxEv, TaxEd, TaxTf, TaxIf + TaxSc)   | 4.92        | 0.219          | 0.052          | 0.115      | 0.407        |
| Three -factor hypothesized model<br>(TaxEv, TaxEd, TaxTf + TaxIf + TaxSc) | 4.85        | 0.231          | 0.040          | 0.000      | 0.382        |

TaxEv – Tax evasion; TaxEd – Tax Education; TaxTf – Traditional factors; TaxIf – Institutional factors; TaxSc – Socio – cultural factors. n = 1052.

CFA was again applied to test the validity and reliability of the hypothesized model. In testing the validity of the constructs, we focused on the extent to which the data exhibit convergent validity and discriminant validity. Convergent validity means that all statements are collected under a single factor. Evidence of convergent validity for a hypothesized model is present if all observable indicators load significantly onto their respective latent factors (Anderson et al., 1988). Three indices were applied in assessing convergent validity: factor loading in the CFA, composite reliability (CR) and average variance extracted (AVE). The result of the convergent validity test is shown in Table 2.

In Table 2, all the standard factor loadings (SFL) ranges from 0.742 to 0.966 for all the factors in the hypothesized model which exceed the recommended level of 0.7 (Bagozzi and Yi, 2012; Hair et al., 2014), indicating acceptable item convergence on the intended constructs.

Also, all the AVE values for the six scales were higher than the acceptable level of 0.5 (Fornell and Larcker, 1981). Moreover, values of composite reliability (CR) of all scales were well above the cut-off point of 0.7 (Nunnally and Bernstein, 1994). The results indicate a satisfactory convergent validity for all constructs in the measurement model.

In assessing the discriminant validity of our constructs, we apply the Heterotrait-monotrait (HTMT) ratio of correlations which indicate an establishment of discriminant validity for HTMT value below 0.90 (Henseler et al., 2015). Discriminant validity refers to the degree to which measures of different concepts are distinct. Table 3 shows the HTMT ratios which meet the threshold of below 0.90 and are significant at 5%, demonstrating discriminant validity.

Reliability of the constructs was assessed using the Cronbach’s alphas ( $\alpha$ ) and AVE values. The results of reliability analyses in Table 2 shows that the Cronbach’s Alphas range from 0.74 to 0.995, which is considered high and above the recommended value of 0.70 (DeVellis, 2012).

Therefore, the results obtained reveal that the measurement model used in this study has good internal consistency reliability, convergent validity and discriminant validity. In other words, these results on validity and reliability provide evidence for the instruments used in this study.

**Inter-correlations**

The object of this section is to assess the appropriateness of the study hypotheses and examine the presence of multicollinearity. Table 4 presents descriptive statistics of the study variables and the correlation between them.

In assessing the appropriateness of the hypotheses of the study, it was observed from Table 4, that, traditional factors correlate positively with tax evasion ( $r=0.328, p < 0.05$ ) and institutional factors have a significant positive relationship with tax evasion ( $r=0.203, p < 0.05$ ); which indicate both hypotheses 1 and 2 were appropriately stated.

However, the direction of socio-cultural factors cannot be determined since some indicators showed positive relationship, whereas others showed negative relationship. Tax education showed a negative relationship with tax evasion ( $r= -0.366, p < 0.05$ ).

Examining our key constructs for multicollinearity, which occurs when there is a strong correlation between two or more predictor variables in a regression model (Field, 2009), Hair et al. (2014) provided two approaches. The first is to examine the correlation matrix among the predictors. A correlation coefficient greater than or equal to 0.90 is an indication of substantial collinearity. The results of our study, from table 4, reported the highest correlation coefficient of 0.211; indicating the absence of collinearity.

Secondly, the variance inflation factor (VIF) was applied to avoid collinearity due to the combined effect of two or more predictors. A threshold of VIF values of 10 is applied (Gaur and Gaur, 2009; Hair et al., 2014). VIF

**Table 2.** Measurement scale and indicators of the hypothesized model.

| Construct                      | Indicators | SFL   | $\alpha$ | CR      | AVE     |
|--------------------------------|------------|-------|----------|---------|---------|
| Tax evasion (TaxEv)            | TaxEv1a    | 0.794 | 0.975**  | 0.979** | 0.838** |
|                                | TaxEv1b    | 0.799 |          |         |         |
|                                | TaxEv1c    | 0.743 |          |         |         |
|                                | TaxEv2a    | 0.812 |          |         |         |
|                                | TaxEv2b    | 0.742 |          |         |         |
|                                | TaxEv2c    | 0.875 |          |         |         |
|                                | TaxEv3a    | 0.762 |          |         |         |
|                                | TaxEv3c    | 0.715 |          |         |         |
| Tax education (TaxEd)          | TaxEd1a    | 0.781 | 0.987    | 0.99    | 0.95    |
|                                | TaxEd1b    | 0.799 |          |         |         |
|                                | TaxEd1c    | 0.754 |          |         |         |
|                                | TaxEd2a    | 0.771 |          |         |         |
|                                | TaxEd2b    | 0.767 |          |         |         |
| Traditional factors (TaxTf)    | TaxTf1a    | 0.781 | 0.848    | 0.904   | 0.598   |
|                                | TaxTf1b    | 0.966 |          |         |         |
|                                | TaxTf1c    | 0.946 |          |         |         |
|                                | TaxTf2a    | 0.799 |          |         |         |
|                                | TaxTf2b    | 0.809 |          |         |         |
|                                | TaxTf2c    | 0.896 |          |         |         |
|                                | TaxTf3a    | 0.705 |          |         |         |
|                                | TaxTf3b    | 0.826 |          |         |         |
| TaxTf3c                        | 0.843      |       |          |         |         |
| Institutional factors (TaxIf)  | TaxIf1a    | 0.789 | 0.905    | 0.996   | 0.972   |
|                                | TaxIf1b    | 0.788 |          |         |         |
|                                | TaxIf1c    | 0.786 |          |         |         |
|                                | TaxIf1d    | 0.886 |          |         |         |
|                                | TaxIf2a    | 0.889 |          |         |         |
|                                | TaxIf2b    | 0.774 |          |         |         |
|                                | TaxIf2c    | 0.791 |          |         |         |
| Socio-cultural factors (TaxSc) | TaxSca     | 0.736 | 0.736    | 0.724   | 0.653   |
|                                | TaxScb     | 0.792 |          |         |         |
|                                | TaxScc     | 0.887 |          |         |         |
|                                | TaxScd     | 0.727 |          |         |         |

values are shown in parentheses on the diagonal in table 4; this indicates there is no problem of multicollinearity.

### Structural equation modelling

The hypothesized tax evasion model (Figure 1) was empirically tested using SEM which allows all paths to be evaluated simultaneously.

### Hypotheses testing

The hypotheses (H1 to H4) was tested by conducting a bootstrap analysis using the Smart PLS, where

subsamples are created with observations randomly drawn (with replacement) from the original set of data. The results of the bootstrap analysis are shown in Table 5.

### Hypothesis 1 to 3

H1 predicted that, traditional factors (tax rate, penalty rates, audit probability) relates positively with tax evasion. Similarly, H2 postulate that, there is positive relationship between institutional factors (corruption and compliance cost) and tax evasion; whereas H3 predicted a significant relationship between socio-cultural factors and tax

**Table 3.** Heterotrait-monotrait (HTMT) ratio of correlations (< 0.9).

| Vairable | TaxEd | TaxEv | TaxIf | TaxSc |
|----------|-------|-------|-------|-------|
| TaxEv    | 0.516 | -     | -     | -     |
| TaxIf    | 0.016 | 0.007 | -     | -     |
| TaxSc    | 0.059 | 0.109 | 0.098 | -     |
| TaxTf    | 0.603 | 0.467 | 0.025 | 0.165 |

**Table 4.** Descriptive statistics and intercorrelations among study variables.

| Variable | Descriptive |        | Intercorrelation co-efficients |          |        |        |        |        |        |
|----------|-------------|--------|--------------------------------|----------|--------|--------|--------|--------|--------|
|          | Mean        | SD     | TaxEv                          | TaxEd    | TaxTf  | TaxIf  | TaxSca | TaxScb | TaxScc |
| TaxEv    | 3.21        | 1.39   | (1.00)                         | -        | -      | -      | -      | -      | -      |
| TaxEd    | 4.18        | 1.09   | -0.366**                       | (1.83)   | -      | -      | -      | -      | -      |
| TaxTf    | 3.59        | 0.77   | 0.328**                        | -0.211** | (1.53) | -      | -      | -      | -      |
| TaxIf    | 3.16        | 1.76   | 0.203**                        | 0.116*   | -0.003 | (1.00) | -      | -      | -      |
| TaxSca   | 40.08       | 12.91  | -0.022                         | -0.007   | 0.044  | 0.013  | -      | -      | -      |
| TaxScb   | 1.50        | 0.50   | -0.018                         | 0.025    | -0.017 | 0.002  | 0.001  | -      | -      |
| TaxScc   | 4.02        | 0.80   | 0.201*                         | -0.002   | -0.014 | -0.025 | -0.055 | -0.033 | -      |
| TaxScd   | 1898.16     | 935.61 | -0.212*                        | -0.001   | 0.000  | -0.027 | -0.019 | 0-.024 | -0.054 |

TaxEv – Tax evasion; TaxEd – Tax Education; TaxTf – Traditional factors; TaxIf – Institutional factors; TaxSca – Age of respondents; TaxScb – Gender; TaxScc – Education level; TaxScd – monthly net taxable income. VIF values are reported in parentheses on the diagonal n = 1052; \*\*p < 0.05; \*p < 0.1.

evasion, since the direction of the relationship could not be established from the literature.

From Table 4, the correlation matrix indicated that traditional factors are positively and significantly related to tax evasion, while institutional factors have a significant positive relationship with tax evasion. However, the relationship between socio-cultural factors and tax evasion was a mixed one. From Table 5, the result of the direct effect of traditional factors on tax evasion is positive and is significant at 1% ( $\beta = 0.413$ ,  $|t| = 4.705$ ,  $p < 0.01$ ). Hence, hypothesis 1 is supported by the tax model and it was conclude at 99% confidence that there is a positive relationship between tax rate and tax evasion and also audit probability and tax evasion.

Also, the direct effect of institutional factors (tax compliance and rate of corruption) on tax evasion showed a positive significant path coefficient at 1% significant level ( $\beta = 0.308$ ,  $|t| = 6.286$ ,  $p < 0.01$ ). Hence, hypothesis 2 is again supported by the tax model. This result is supported by several studies in the literature (Ivanova et al., 2005). Socio-cultural factors showed a negative relationship ( $\beta = -0.002$ ,  $|t| = 0.057$ ) with tax evasion, though, the relationship was not significant. Hence, hypothesis 3 was not supported and hence the hypothesis is rejected.

**Hypothesis 4**

This hypothesis seek to examine the role of tax education in the relationship between traditional factors, institutional

factors, socio-cultural factors on one side and tax evasion on the other side. From Table 4, tax education relates negatively with traditional factors ( $r = -0.211$ ,  $p < 0.05$ ) and tax evasion ( $r = -0.366$ ,  $p < 0.05$ ). This relationship is confirmed by the bootstrap analysis result of which is shown in Table 5. The result shows that, the direct effect of traditional factors on tax education is negative and is significant at 1% ( $\beta = -1.009$ ,  $|t| = 25.127$ ,  $p < 0.01$ ) and tax education has a direct negative and significant effect on tax evasion ( $\beta = -0.416$ ,  $|t| = 4.527$ ,  $p < 0.01$ ). However, traditional factors and tax evasion relates positively and the relationship is significant ( $\beta = 0.413$ ,  $|t| = 4.705$ ,  $p < 0.01$ ). This implies that, tax education mediate the positive relationship between traditional factors and tax evasion as there is a positive and significant indirect relationship between traditional factors and tax evasion (standardized indirect effect  $\beta = 0.237$ ,  $|t| = 4.309$ ,  $p < 0.01$ ). On this basis, hypothesis 4 is supported by the tax model.

Again, tax education relates negatively with institutional factors( $r = -0.116$ ,  $p < 0.05$ ). The bootstrap analysis shown in Table 5 confirms this relationship which shows that, the direct effect of institutional factors on tax education is negative and is significant at 1% ( $\beta = -0.474$ ,  $|t| = 2.102$ ,  $p < 0.05$ ) and as stated earlier, tax education has a direct negative and significant effect on tax evasion ( $\beta = -0.416$ ,  $|t| = 4.527$ ,  $p < 0.01$ ). However, institutional factors and tax evasion relates positively and the relationship is significant ( $\beta = 0.308$ ,  $|t| = 6.286$ ,  $p < 0.01$ ). This implies that, tax education mediate the positive

**Table 5.** Direct, indirect and total effects of the hypothesised tax evasion model.

| Variable                               | Original sample (O) | Standard error (STERR) | T statistics ( O/STERR ) | p-values |
|--|---------------------|------------------------|--------------------------|----------|
| <b>Standardised direct effects</b>     |                     |                        |                          |          |
| Traditional factors → Tax education    | -1.009              | 0.040                  | 25.127                   | 0.000*** |
| Traditional factors → Tax evasion      | 0.413               | 0.088                  | 4.705                    | 0.000*** |
| Institutional factors → Tax education  | -0.474              | 0.225                  | 2.102                    | 0.031**  |
| Institutional factors → Tax evasion    | 0.308               | 0.049                  | 6.286                    | 0.000*** |
| Socio-cultural factors → Tax education | 0.006               | 0.037                  | 0.154                    | 0.211    |
| Socio-cultural factors → Tax evasion   | -0.002              | 0.028                  | 0.057                    | 0.532    |
| Tax education → Tax evasion            | -0.416              | 0.091                  | 4.572                    | 0.000**  |
| <b>Standardised indirect effects</b>   |                     |                        |                          |          |
| Traditional factors → Tax evasion      | 0.237               | 0.055                  | 4.309                    | 0.000*** |
| Institutional factors → Tax evasion    | 0.468               | 0.223                  | 2.099                    | 0.041**  |
| Socio-cultural factors → Tax evasion   | -0.020              | 0.015                  | 1.333                    | 0.081*   |
| <b>Standardised total effects</b>      |                     |                        |                          |          |
| Traditional factors → Tax education    | -1.009              | 0.040                  | 25.127                   | 0.000*** |
| Traditional factors → Tax evasion      | 0.650               | 0.039                  | 16.494                   | 0.000*** |
| Institutional factors → Tax education  | 0.474               | 0.225                  | 2.102                    | 0.031**  |
| Institutional factors → Tax evasion    | 0.776               | 0.225                  | 3.449                    | 0.012**  |
| Socio-cultural factors → Tax education | 0.006               | 0.037                  | 0.154                    | 0.211    |
| Socio-cultural factors → Tax evasion   | -0.021              | 0.070                  | 0.300                    | 0.159    |
| Tax education → Tax evasion            | 0.416               | 0.091                  | 4.572                    | 0.000*** |

n = 1052; \*\*\*p < 0.01, \*\*p < 0.05; \*p < 0.1. Standardized estimates were made from 5,000 bootstrap subsamples.

relationship institutional factors and tax evasion as there is a positive and significant indirect relationship between institutional factors and tax evasion (standardized indirect effect  $\beta = 0.468$ ,  $|t| = 2.099$ ,  $p < 0.05$ ). In this direction, hypothesis 4 is again supported by the tax model.

Again, tax education had a mixed relationship with the socio-cultural factors. For instance, it correlates negatively with age, gender and income but relate positively with education level, coefficient and significance level shown in Table 4. However, these relationships are not significant. The bootstrap analysis in Table 5 also confirms that, the relationship between socio-cultural factors and tax education, though positive, is not significant. Thus, in respect to socio-cultural factors, hypothesis 4 is unsupported by the tax model.

## DISCUSSION

Recent tax research on tax evasion (Schneider et al., 2008) has focused much on the implications of taxpayers' non-compliance with the tax laws and also focused on developed economies. Even those that focus on developing economies such as Ghana (Ameyaw and Dzaka, 2016; Ameyaw et al., 2015), who studied the determinants of tax evasions, has suggested the need to

examine the underpinning explanations by which the factors identified thereof translates into tax evasion behaviour of tax payers. In this direction, this study makes the following contributions in advancing the frontiers of knowledge in the tax evasion literature.

The study examined a structural model which combines a mediating variable in the relationship between a set of predictor latent variables (traditional, institutional and socio-cultural factors) and tax evasion. Though, there has been a number of previous studies examining the relationship between these predictors and tax evasion (Kirchler, 2007; Bagdigen et al., 2010; McGee and Tyler, 2006), this study attempt to break the grounds by examining the role of a mediating variable in the relationship between the predictors and tax evasion through a study of the direct and indirect effects on tax evasion in developing economies such as Ghana. The contribution of this study to the tax literature is contained in our hypothesised model.

The study provided results which support prior research on tax evasion. For instance, it confirms that, tax education plays a significant role in mediating the relationship between tax rates, penalty for tax non-compliance and audit probability, and then tax evasion. Though, traditional factors showed a positive direct relationship, educating respondents on the need to pay

taxes moderate the extent to which these factors contribute to tax evasion. However, the strength of this relationship was weak.

The findings of the study again showed that, increases in tax rates, penalty for tax non-compliance and audit probability (collectively known as traditional factors) and the cost of compliance and corruption level of tax officials would lead to increase in tax evasion level as the study shows a direct positive effect on tax evasion. The tax education mediating negatively in this relationship reveal that, intensifying tax education on tax payers will reduce the negative impact of traditional and institutional factors and hence reduce tax evasion. This conclusion is in line with Ameyaw et al. (2016) who captured the notion that, the transparency and understanding of the tax system is directly proportional to taxpayer's willingness to pay taxes and hence the amount of taxes government may be able to mobilise.

## LIMITATIONS AND SUGGESTION FOR FUTURE RESEARCH

This study makes a valuable contribution in the area of tax evasion, but not without limitations. The study focused on only some part of the country, and could be conducted across the ten regions of Ghana. As a result, the analysis could not bring out regional differences in the determinants. This however provides an opportunity for future research in the area of tax evasion. To identify the determinants of tax evasion, this study developed a structural equation model. The final model grouped the determinants into two: traditional and institutional factors together with the tax evasion indicate a three variable model. In practice, other factors which are not captured by the model may also influence tax evasion. Although our findings have extended and expanded our knowledge in the literature of tax evasion, the results and conclusions of this study should be treated as preliminary, until future research replicates them with samples from a broader study area. For that reason, we call for future experimental research to help confirm our findings.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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