



*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*

## **Tax Compliance in Sub-Saharan Africa: How Important are Non-Pecuniary Factors?**

Kofi Kamasa<sup>\*</sup>, George Adu<sup>\*\*</sup> & Eric Fosu Oteng-Abayie<sup>\*\*\*</sup>

### **Abstract**

This paper assesses the importance of non-pecuniary factors on tax compliance in Sub-Saharan Africa (SSA). In addition, the paper examines how legal origins affect tax compliance factors. Using the Round 5 of the Afrobarometer survey data across 29 countries, the findings revealed that non-pecuniary factors in the form of tax knowledge limitation; non-compliance by others; and corruption of tax officials are associated with reductions in the probability of tax compliance in SSA. On the contrary, factors such as trust in tax department; handling the provision of health, education and road needs, tend to be associated with increase the probability of complying with tax laws and obligations in SSA. In terms of legal origins, institutions and fiscal exchange have bigger association with compliance for common law countries (British origin) and civil law countries (French origin) respectively.

**JEL Classification:** H26, H41

**Keywords:** Tax knowledge, tax compliance, fiscal exchange, institutions, SSA

---

<sup>\*</sup> Corresponding author, Department of Management Studies, University of Mines and Technology, Tarkwa – Ghana, Email: [kofikamasa@hotmail.co.uk](mailto:kofikamasa@hotmail.co.uk), +233 (0) 2093030 18

<sup>\*\*</sup> Department of Economics, Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, Email: [gyagu2011@gmail.com](mailto:gyagu2011@gmail.com), +233 (0) 5455105 38

<sup>\*\*\*</sup> Department of Economics, Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, Email: [oteng\\_abayie@yahoo.com](mailto:oteng_abayie@yahoo.com), +233 (0) 5424532 37

## **1. Introduction**

Although an increase in revenue collection effort through a well-functioning tax system is necessary to create fiscal space, provide essential public services, reduce foreign aid and single resource dependence, the domestic tax bases in most African countries are undermined by widespread tax avoidance and evasion (IMF 2011). Moreover, Schneider et al. (2010) estimated the shadow economy in sub-Saharan Africa to be 40.2%. High tax compliance is therefore necessary for efficiency and equity as well as for the development of social capital (see Slemrod, 1998). The reason is that while reducing tax evasion improves the government's revenue, it is also a broader issue for the development of a civil order (Knack and Keefer, 1997).

Taxpayers' behaviour is such that they are not willing to comply with tax laws when given the opportunity. That notwithstanding, if we consider the benefit that could be obtained with evading taxes, then what influences individuals to comply with tax obligations becomes a question worthy of consideration. In this regard, understanding the attitude of taxpayers with respect to factors that affect their compliance and how to influence these factors would obviously be very essential to enhancing revenue generation for economic growth and development. The objective of this paper therefore is to assess the importance of non-pecuniary factors on tax compliance in Sub-Saharan Africa (SSA).

There are policies such as high penalty rate and increasing inspection by tax officials in SSA. Yet this is not reflecting in high compliance (less tax evasion and avoidance). Also, judging from the fact that the conventional deterrence theory in evidence has not always encouraged compliance (see Fatás & Roig, 2004), it becomes necessary to assess the role played by non-pecuniary factors in shaping and improving tax compliance. Non-pecuniary factors refer to factors that are not determined by rational cost-benefit considerations as argued by the deterrence theory of tax compliance (see Allingham and Sandmo, 1972), which may include tax knowledge, institutions, fiscal exchange among others. Such evidence will provide the core basis for reforming institutions and the tax system. This will then have the potential of reducing compliance cost, improving tax administration, and accountability of public officials, and hence reduces non-compliance.

This paper contributes to the literature on tax compliance in SSA in two stances. First, it employs data based on recent individual-level survey to analyse the importance of non-pecuniary factors on tax compliance in SSA. Second, it fills the literature gap by looking at whether legal origins (British common law and French civil law) have association with compliance factors. This is because, with regards to legal origins, the legal framework in a country affects attitude and how businesses are conducted and therefore how compliant people are to tax regulations.

By employing the Probit estimation method and controlling for individual, location and country characteristics, the paper revealed that non-pecuniary factors in the form of tax knowledge limitation; non-compliance by others; and corruption of tax officials are associated with reductions in the probability of tax compliance in SSA. On the contrary, factors such as trust in tax department; handling the provision of health, education and road needs, tend to be associated with increase the probability of complying with tax laws and obligations in SSA. In terms of legal origins, institutions and fiscal exchange have bigger association with compliance for common law countries (British origin) and civil law countries (French origin) respectively.

The rest of the paper is structured as follows. Section 2 presents stylised facts on tax revenue, tax effort and shadow economy in sub-Saharan Africa. Section 3 deals with the literature review on tax compliance. The baseline model, empirical strategy and data sources are laid out in Section 4. The empirical results are presented and discussed in section 5. Section 6 presents robustness checks and section 7 concludes the paper.

## **2. Stylised Facts on Tax Revenue, Tax Efforts and Shadow Economy in SSA**

Tax revenue/GDP has not been sustained on an upward level although there have been many policy measures put in place to boost revenue generation. The ratio of tax revenue to GDP in SSA stood at 14.32% by end of 2003. This figure improved by the end of 2004 to 14.81%. This was sustained and further improved to 17.95% by the end of 2008. Thereafter, sustenance has been a major problem as the ratio has been dropping on a whole and reaching as low as 15.79% by the end of 2013 as shown in Figure 1.

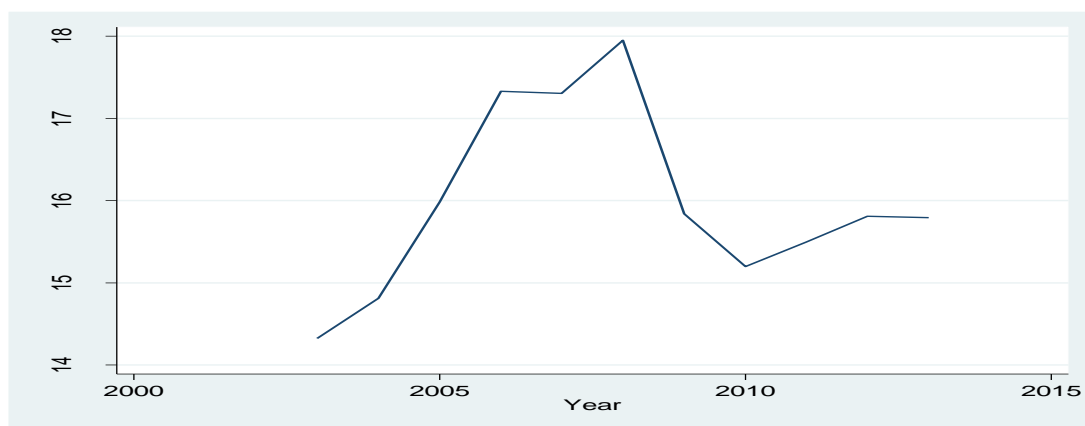
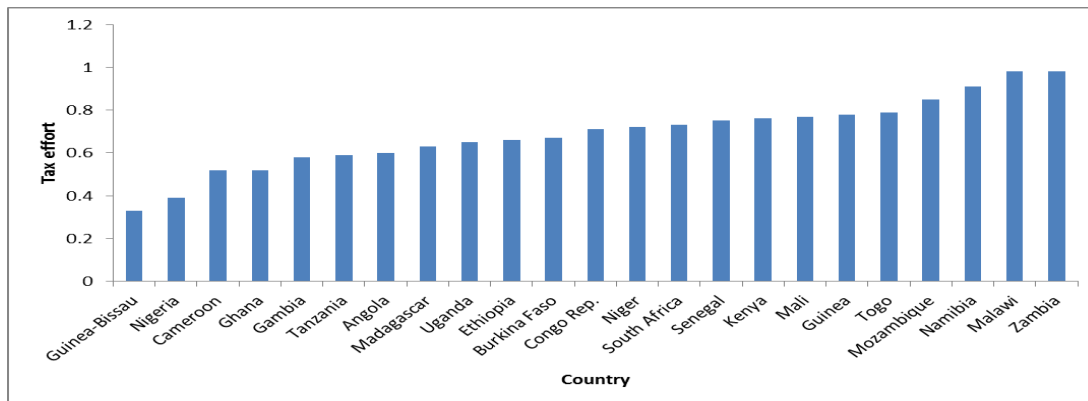


Figure 1. Tax revenue/GDP in SSA

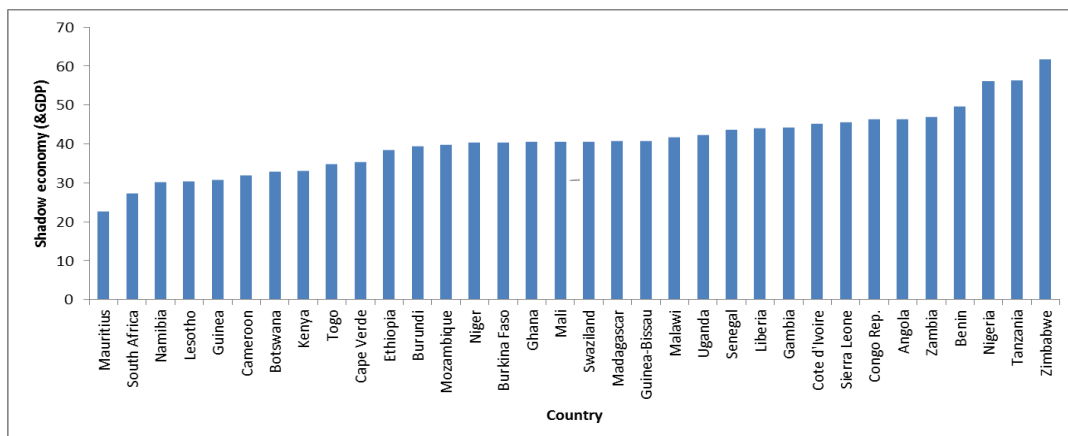
One possible explanation is attributed to tax evasion. According to Global Financial Integrity estimates, Sub-Saharan Africa suffers from the biggest loss in terms of tax evasion (Kar and LeBlanc, 2013). The ability to increase tax revenue to a large extent depends on tax effort. Tax effort is the index of the ratio between the share of the actual tax collection to GDP and the predicted taxable capacity (Stotsky, et al., 1997). In this case, “high tax effort” is when the ratio is greater than one (1) - meaning that the country utilizes its tax base very well in order to increase tax revenues. A “low tax effort” is when the ratio is less than one (1) – meaning that the country may have relatively substantial scope or potential to raise tax revenues. For Sub-Saharan Africa, Fenochoietto and Pessino (2013) estimated a tax effort of 0.71. It must be noted that majority of countries even had tax effort less than the average of 0.71 as displayed in Figure 2. Guinea-Bissau and Nigeria had the lowest of tax efforts of 0.33 and 0.39 respectively. Few countries came close to the achieving tax effort of 1. These include Mozambique (0.85), Namibia (0.91), Malawi (0.98) and Zambia (0.98).

It is clear from the Figure 2 that tax revenue generation in SSA is below its potential. A plausible reason that can be given is either low compliance or non-compliance. To support this claim is Schnieder at al., (2010) who estimated the shadow economy as a ratio of GDP for SSA from 1999 – 2007 to be 40.2%. Estimate for countries is illustrated in Figure 3. The estimates illustrated depict a high level of shadow economy across SSA with the exception of few countries whose estimates are less than world’s average of 33%. These countries include Mauritius (22.7%), South Africa (27.3%), Namibia (30.3%) and Lesotho (30.5). Countries

such as Nigeria, Tanzania and Zimbabwe had the worst in terms of estimates with shadow economy estimates of 56.4%, 56.2% and 61.8% respectively.



**Figure 2. Tax effort in selected countries in SSA**



**Figure 3. Shadow economy across Sub-Saharan countries**

Thus the important question that arises from the above analysis is, how can tax compliance be improved in SSA? It is for this reason that this paper seeks to assess the importance of non-pecuniary factors on tax compliance in SSA.

### 3. Review of Related Literature

Tax compliance is a major problem for many tax authorities and it is not an easy task to persuade taxpayers to comply with tax requirements even though 'tax laws are not always precise' (James and Alley, 2004). Tax compliance is probably the most neutral term for describing the willingness of the taxpayer to pay taxes (Kirchler 2007). Essentially it means that the person declares voluntarily and pays in a timely manner all tax liabilities and along with all these, accounting for taxation purposes shall be in compliance with the valid norms pursuant to the tax law (OECD 2008).

The benchmark economic model of tax evasion over the last half century has been the Allingham and Sandmo (1972) model, in which self-interested taxpayers choose how much income to report to the tax authority by trading off the benefits of evasion (lower tax payments) against the costs of evasion (the possibility of being caught and punished). The key policy parameters affecting tax evasion and compliance to that effect are tax rate, the detection probability, and the penalty imposed conditional on the evasion being detected. However, there is an apparent disconnect between much of the academic literature on tax

compliance and the administration of tax policy (Luttmer and Singhal, 2014). While tax administrators are obviously concerned about enforcement, they also tend to place a great deal of emphasis on improving “tax morale,” by which they generally mean increasing voluntary compliance with tax laws and creating a social norm of compliance.

Torgler and Schneider (2007) argue that values and attitudes can affect individual behaviour. Apart from sanctions, Spicer and Lundstedt (1976) argued that a set of attitudes and norms might have effect on the choice between tax compliance and evasion. Lewis (1982) points out that “it could be that tax evasion is the only channel through which taxpayers can express their antipathy ... we can be confident in our general prediction that if tax attitudes become worse, tax evasion will increase”. Therefore, we can state that values and attitudes can affect individual’s behaviour and hence compliance. Individuals consider tax evasion (non-compliance) to be a less serious wrongdoing the more widespread they presume it to be (Frey and Torgler, 2007). In line with this, tax compliance is said to be affected by tax morale; with the later been seen as an internalized social norm for the former (Elster, 1989). Specifically, as in Gordon (1989) and Traxler (2010), the strength of the norm depends on an individual specific degree of norm internalization and the endogenously determined share of evaders in the economy (with a higher share inducing a weaker norm). Hence, individual evasion decisions depend on the behaviour of others implying that individuals act conditionally cooperative (Gaechter, 2006).

The influence of knowledge on tax compliance behaviour has been proven in various research (see Mohamad Ali *et. al.*, 2007; Singh, 2003; Eriksen and Fallan, 1996; Harris, 1989 etc). According to Eriksen and Fallan, (1996), the level of education received by taxpayers is an important factor that contributes to the general understanding about taxation especially regarding the laws and regulations of taxation and hence their ability to comply with them. Also, studies on the relationship between the specifics of actual government spending and tax compliance, particularly on tax evasion, are very limited (Palil and Ahmad, 2011). According to them, logically, taxpayers, and especially those who pay high amounts of tax, will be sensitive to what the government spends their money on. Although there is limited empirical evidence, it is reasonable to assume that taxpayers will tend to evade tax and for that matter, will not comply to tax if they perceive that the government spends tax money unwisely.

It must be noted that institutions that respect the preferences of the citizens will have more support by the people than a state that acts as a Leviathan (see Prinz, 2010). Such a supportive behaviour has a positive effect on compliance. Levi (1988) points out that a possibility to create or maintain compliance is to provide reassurance by the government. A government that pre-commits itself with direct democratic rules imposes itself restraints on its own power and thus sends a signal that taxpayers are seen as responsible persons (Torgler, 2003). As Frey (2003) points out, taxpayers are treated as “*citizens* rather than subjects, and have extensive rights *and* obligations to their state”. Table 1 summarizes the empirical findings of selected studies in developing countries.

**Table 1. Empirical studies on tax compliance in developing countries**

Author(s)	Region & Data source	Method used	Findings	
			Individual-based	Policy-based
D'Arcy (2011)	Africa, Afrobarometer (2005)	Ordered Probit	Primary education (+), Female (-), Illiterate (-)	Tax enforcement (+), trust (+), satisfaction with democracy (+), handling and access to: health (+) and education (+)
Hug and Sporri (2011)	World and Easter Europe, World Value Survey (WVS) and Europe Value Survey (EVS), (1995-1997)	Orderd Probit	Married(+), Age(+), female(+), retired(+), self-employed(-)	Confidence in legal system(+), satisfaction in incumbent(+)
Daude and Melguizo (2010)	Latin America, Latinobarometro(LB), (2007 & 2008)	Probit/Orderd Probit	Age(+), female(-), education(+), religion(-)	Satisfaction with democracy(+), services(+), corruption(-)
Levi and Sacks (2009)	Africa, Afrobarometer (2005)	Multi-level Logit	Female(-), wealth, TV, car, radio (-)	Efforts to combat corruption(+), enforcement of taxes(+), fair treatment(+), satisfaction with local government(+)
Torgler (2005)	Latin America and Carribean, WVS & LB (1981-1997, 1998)	Ordered Probit	Age(+), female(-), married(+), religion(+), financial satisfaction(+)	Trust in president(+), trust in democracy(+), satisfaction with national officers(+)
Torgler (2004)	Asia, WVS (1995-1997) India & Japan, WVS (1981, 1990, 1995)	Ordered Probit	Age(+), self-employed(-), unemployed(-), financial satisfaction(+)	Trust in: government(+), in legal system(+), in democracy(+)
Torgler (2003)	Eastern Europe, WVS (1989-1993, 1995-1998)	Ordered Probit	Age(+) female(+), married(+), self-employed(-), retired(+)	Trust in: government(+), in legal system(+), in democracy(+)

NB: only robust and significant results are reported.

#### **4. Empirical Strategy and Data**

##### **4.1 Model Specification**

The estimable equation is specified as shown in equation 1, following the analytical development by Cummings et al (2009)<sup>1</sup>.

$$TC_i = \alpha + \gamma A_i + \delta B_i + \theta T_i + \varepsilon_i \quad (1)$$

Where  $TC_i$  is tax compliant attitude. The vector  $A_i$  is individual level characteristics made up of age, sex, education, employment status and area of residence (rural or urban).  $B_i$  encompasses vector of non-pecuniary factors (corruption of tax officials, trust in courts, trust in tax departments, fighting corruption, tax knowledge limitation, perceived non-compliance by others as well as handling health, education, road and electricity needs). Finally,  $T_i$  is a vector of control variable for pecuniary factor (difficulty in evading tax) as well as dummy variables capturing country and location fixed effect whilst  $\varepsilon_i$  is the error term.

##### **4.2 Estimation Strategy**

For the purpose of this paper, the dependent variable is designed to cater for whether an individual is either tax compliant or not compliant. Thus the model of interest for estimation in equation (1) has a response variable that is binary by nature (yes/no). The application of the ordinary least squares (OLS) in such situation is through the use of linear probability model (LPM)<sup>2</sup>. However, Wooldridge (2009) noted that “The two most important disadvantages of LPM are that, the fitted probabilities can be less than zero or greater than one and the partial effect of any explanatory variable is constant”. To overcome these problems of estimation, the Binary Probit is adopted for this paper because Probit analysis developed from the need to analyse qualitative (dichotomous or polytomous) dependent variables within the regression framework. The Probit procedure computes maximum likelihood estimates of the parameters and of the probit equation. In that case, the model will be estimated via the Maximum Likelihood Estimation (MLE), which is a method of estimating the parameters of a statistical model given observations, by finding the parameter values that maximises the likelihood of making the observations given the parameters.

##### **4.3 Data and Descriptive Statistics**

This paper used the Afrobarometer survey data Round 5 (2015) for 29 countries in SSA. Countries covered in this study are shown in Table A1 (see the appendix). *Afrobarometer* is a pan-African, non-partisan research network that conducts public attitude surveys on democracy, governance, economic conditions, and related issues in more than 35 countries in Africa. In order to prevent an assumed direct implication of a “*wrongdoing*” on the part of respondent, an indirectly phrased question was adopted. Respondents were asked in the questionnaire to state their opinion about other people who do not pay taxes they owe on their income. On an interval scale of 1 – 3, respondents are asked to state if they think the action of other people who do not pay taxes on their income is [1]“*not wrong at all*”, [2]“*wrong but understandable*” or [3]“*wrong and punishable*”. Given the response, an individual is regarded as having tax compliant attitude if their response is [3]“*wrong and punishable*”. An individual is regarded as having non-compliant attitude if the response is either [1]“*not wrong*

---

<sup>1</sup> Cummings et al (2009)<sup>1</sup>, modified the deterrence theory by Allingham and Sandmo (1972) and Yitzhaki (1974) to inculcate non-pecuniary factors that can affect tax compliance

<sup>2</sup> For further details on the limitations of the LPM, see Wooldridge (2009); Gujarati (2004); Agresti (1990)

at all” or [2]“*wrong but understandable*”. For the independent variables, interval scale score of 1 – 4 or 0 – 1 were assigned depending on responses given for variables. These responses were subsequently recoded into dummies. Table A2 (see the appendix) gives a formal definition and description of the data variables.

The summary statistics indicates that about 50% of respondents are likely to comply with tax obligations. About 64% of respondents indicate limitation with regards to tax knowledge with a corresponding standard deviation of 0.479. Mean age of respondents is estimated to be 37yrs with a minimum of 18yrs and maximum of 105yrs. A mean value of 0.506 also indicates that about 51% of respondents are males with 49% being females. Perceived non-compliance by others forms about 29% of respondents with that of corruption by tax officials taking 36%. Also, about 61% of respondents reside in rural areas while about 33% of respondents are employed. The rest of the summary statistics of the variables is shown in Table A3 (see the appendix). Table A4 (see the appendix) also illustrates the Pearson correlation matrix for the dependent variable and independent variables for the study.

## **5. Results and Discussions**

The empirical results are shown in Tables 2 and 3. Table 2 displays results for Sub-Saharan Africa in general while Table 3 looks at the relationship of these factors on compliance from the legal origins perspective. Tax knowledge limitation has a negative and significant relationship with tax compliance in Sub-Saharan Africa as shown in Table 2. The marginal effect estimate means that the probability of being compliant to tax obligations decreases by 5% if tax knowledge is perceived to be limited. This result is in line with other studies as Palil and Ahmad (2011), Mohamad Ali *et. al.*, (2007), Singh (2003), Eriksen and Fallan (1996) and Harris (1989). In terms of legal origin as shown in Table 3, common law countries (British origin) has a marginal effect of 7% decrease in tax compliance if tax knowledge difficulty is perceived as compared to an approximately 2% decrease for civil law countries (French origin).

Perceived non-compliance by others has a negative and significant relationship with tax compliance with a resulting marginal effect of reducing the compliance behaviour in Sub-Saharan Africa by 2%. Both legal origins (British and French) countries have negative and significant marginal effect (2% approximately) of perceived non-compliance by others on probability of being tax compliant. According to Frey and Torgler, (2007), individuals consider tax evasion (non-compliance) to be a less serious wrongdoing the more widespread they presume it to be. This finding agrees with others such as Alm *et al.*, (2017); Ho *et. al.*, (2013); and Jayawardane (2016).

Corruption on the part of tax officials negatively affects compliance behaviour in SSA with a marginal effect of about 2%. This is not surprising because it is clear that people have low compliance tendencies when they believe that their taxes will not go towards the provision of public goods or other good courses but to the pockets of corrupt public officials (Uslaner, 2008). Levi and Sachs (2009) confirm this finding when they studied governments’ legitimacy to collect taxes. British legal origin countries have a marginal effect of 2% decrease in the probability of being compliant given a perception of tax officials being corrupt as opposed to an insignificant marginal effect for the case of French legal origin countries.

**Table 2. Results of non-pecuniary tax compliance determinants in Sub-Saharan Africa**

**Dependent variable: Tax compliance**

Variable	Coefficient	Marginal Effect
Tax knowledge limitation	-0.126*** (0.016)	-0.050*** (0.006)
Perceived noncompliance by others	-0.053*** (0.016)	-0.021*** (0.006)
Corruption	-0.051*** (0.016)	-0.020*** (0.006)
Trust in tax department	0.112*** (0.016)	0.045*** (0.006)
Trust in courts	0.012 (0.016)	0.005 (0.006)
Fighting corruption	0.057*** (0.016)	0.023*** (0.007)
Health	0.046** (0.018)	0.018*** (0.007)
Education	0.065*** (0.018)	0.026*** (0.007)
Road	0.052*** (0.017)	0.020*** (0.007)
Electricity	0.023 (0.018)	0.009 (0.007)
Difficulty in evading tax	0.071*** (0.017)	0.028*** (0.007)
Age	0.002*** (0.001)	0.001*** (0.0005)
Male	0.056*** (0.015)	0.022*** (0.006)
Education primary	0.126*** (0.023)	0.050*** (0.009)
secondary	0.161*** (0.024)	0.064*** (0.010)
tertiary	0.245*** (0.031)	0.097*** (0.012)
Rural	-0.041** (0.016)	-0.017*** (0.006)
Employment status	-0.036** (0.016)	-0.014** (0.007)
Country effect	YES	
Region effect	YES	
Weight	YES	
Observations	42,641	
Prob(F-Statistic)	0.000	

NB: Tabulates are regression and marginal effect coefficient. Robust Standard errors in parenthesis are clustered around country. \*\*\*, \*\*, \* signifies significance level of 1%, 5% and 10% respectively. Regression include a constant term (not shown)

**Table 3. Results of non-pecuniary tax compliance determinants in common law (British origin) and civil law (French origin) countries**

Dependent variable: Tax compliance

Variable	British		French	
	Coefficient	Marginal Effect	Coefficient	Marginal Effect
Tax knowledge limitation	-0.182*** (0.022)	-0.072*** (0.009)	-0.054** (0.026)	-0.021** (0.010)
Perceived noncompliance by others	-0.037* (0.022)	-0.015* (0.009)	-0.048* (0.026)	-0.019 (0.011)
Corruption	-0.053*** (0.021)	-0.021*** (0.008)	-0.018 (0.025)	-0.007 (0.010)
Trust in tax department	0.109** (0.021)	0.044*** (0.009)	0.101*** (0.026)	0.040*** (0.010)
Trust in courts	0.002 (0.022)	0.001 (0.009)	0.040 (0.026)	0.016 (0.010)
Fighting corruption	0.049* (0.023)	0.020** (0.009)	0.075** (0.026)	0.029*** (0.010)
Health	-0.007 (0.025)	-0.003 (0.010)	0.092*** (0.028)	0.036*** (0.011)
Education	0.034 (0.025)	0.014 (0.010)	0.110*** (0.028)	0.043*** (0.011)
Road	0.042* (0.023)	0.017* (0.009)	0.085*** (0.027)	0.034*** (0.010)
Electricity	0.037 (0.024)	0.015 (0.009)	0.043 (0.030)	0.018 (0.012)
Difficulty in avoiding tax	0.090*** (0.023)	0.036*** (0.009)	0.039 (0.028)	0.015 (0.011)
Age	0.003*** (0.001)	0.001*** (0.0003)	0.002** (0.001)	0.001*** (0.0003)
Male	0.039** (0.020)	0.015* (0.008)	0.063** (0.024)	0.025*** (0.009)
Education				
Primary	0.114*** (0.035)	0.045*** (0.014)	0.117*** (0.033)	0.046*** (0.013)
Secondary	0.141*** (0.036)	0.056*** (0.014)	0.167*** (0.036)	0.065*** (0.014)
Tertiary	0.247*** (0.044)	0.102*** (0.017)	0.223*** (0.048)	0.086*** (0.018)
Rural	-0.043** (0.022)	-0.017* (0.009)	-0.058** (0.026)	-0.023** (0.010)
Employment status	-0.031 (0.021)	-0.012 (0.008)	-0.077** (0.029)	-0.030*** (0.011)
Country effect	YES		YES	
Regional effect	YES		YES	
Weight	YES		YES	
Observations	23,879		14,797	
Prob(F-Statistic)	0.000		0.000	

NB: Tabulates are regression and marginal effect coefficient. Robust Standard errors in parenthesis are clustered around country. \*\*\*, \*\*, \* signifies significance level of 1%, 5% and 10% respectively.

As far as institutions are concerned, perceived increase in the trust in tax department has 5% increase on the probability of being tax compliant in SSA. Both legal origin countries shows positive and significant association with a marginal impact of 4% each on the probability of being tax compliant given a perceived increase in trust in tax department. Trust in courts surprisingly has insignificant relationship both in the case of SSA and the legal origin countries. The extent to which government is committed to fighting corruption has positive and significant relationship on tax compliance in SSA with a marginal impact of 2%. This is also the case for both legal origin countries although the marginal effect is bigger in French legal origin countries (3%) than British (2%). These results on institutions confer with findings from studies such as Levi and Sachs (2009); Daude et al., (2013); D'Arcy (2011); Kogler et al., (2013).

Satisfaction with public expenditures and services can serve as a measure of how well governments convert taxes into expenditures and that government expenditures may motivate compliance by providing goods and service that citizens prefer (see Torgler, 2005). This is confirmed with a positive and significant relationship on the probability of tax compliance behaviour in SSA when there is a perceived improvement in the extent to which government handles the provision of health, education and road (marginal effect of 2%, 3%, 2% respectively). From the stance of the legal origin, civil law countries has a positive and significant relationship on the probability of tax compliance for perceived improvement with respect to handling health and road needs (4% and 3% respectively). Common law countries has positive and significant association on compliance with respect to only handling of road needs (2%).

## **6. Robustness Check**

The paper conducted a number of robustness<sup>3</sup> checks to support the results from the baseline estimates. Firstly, given the responses for the tax compliance variable - [1]“*not wrong at all*”, [2]“*wrong but understandable*” or [3]“*wrong and punishable*”, it can be argued that those who responded [2]“*wrong but understandable*” may be having compliant attitude. Thus to cater for such cases, Ordered Probit was used to estimate the tax compliance. Secondly, in order to check for robustness on the dummies created for estimation, the multi-level probit is estimated. Thirdly, since the dependent variable is binary, an equally important estimator that could be used is the logistic regression. Thus the paper estimated the results using logit and results are presented in column 1 of Table A5 (see the appendix). Similarly, the linear probability model (LMP) estimator although is discussed to have limitations with regards to binary dependent variables, it is also used to check the robustness with results shown in column 2 of Table A5 (see the appendix) Furthermore, it could be argued that pooling all countries may produce bias estimates because there are differences with respect to institutional reforms, macroeconomic management among others, which can affect compliance behaviour differently from one country to the other. Thus the paper controlled for country-level factors such as GDP per capita and inflation as well as institutional reform indicators such as government efficiency, rule of law and regulatory quality. Results are displayed in columns 3 - 7 of Table A5 (see the appendix). In all the scenarios, it is seen that the results confirm those of the baseline, since there is no difference statistically with respect

---

<sup>3</sup> The robustness checks shown in this paper cater for only the case of SSA as a whole. The results for the legal origins are not shown although they were estimated. Also, results for ordered probit and multi-level probit are not displayed due to space.

to the significance and signs of the variables – thus providing support for robustness of the initial results presented for analysis.

## **7. Conclusion and Policy Implications**

This paper assessed the importance of non-pecuniary factors on tax compliance in Sub-Saharan Africa (SSA). In addition, the paper examined how legal origins affect tax compliance factors. Using the Round 5 of the Afrobarometer Survey data across 29 countries, the findings revealed that non-pecuniary factors in the form of tax knowledge limitation; non-compliance by others; and corruption of tax officials are associated with reductions in the probability of tax compliance in SSA. On the contrary, factors such as trust in tax department; handling the provision of health, education and road needs, tend to be associated with increase the probability of complying with tax laws and obligations in SSA. In terms of legal origins, institutions and fiscal exchange have bigger association with compliance for common law countries (British origin) and civil law countries (French origin) respectively.

The negative relationship between tax knowledge limitation and tax compliance serves as a basis for the revenue collection institutions in SSA to increase awareness for taxpayers with respect to tax matters and also as an input in the designing of tax education programs to target taxpayers and potential taxpayers. Having been revealed that corruption by tax officials discourages tax compliance, punitive action against corrupt officials can have an important deterrent effect. The role of the media is important in publicizing the punishment of corrupt officials. The least the governments in SSA could do is to continue with the provision of basic infrastructure/needs as health, education, roads and electricity since these have been evidenced to have positive effect on tax compliance. Providing such needs give taxpayers a feel of having back the taxes paid and are willing to comply even more.

## **References**

- Agresti, A. (1990). *Categorical Data Analysis*. John Wiley & Sons, Inc. New York, NY
- Allingham, M. and Sandmo, A. (1972). Income Tax Evasion: A Theoretical Analysis. *Journal of Public Economics* 1:323-338
- Alm, J., and J. Martinez-Vazquez. (2003). Institutions, Paradigms, and Tax Evasion in Developing and Transition Countries, in *Public Finance in Developing and Transition Countries*, eds. J. Martinez-Vazquez and J. Alm, Edgar Elgar: 146-178
- Ali, M., Fjeldstad, O. H. and Sjursen, I. (2013). Factors affecting tax compliance attitudes in Africa: Evidence from Kenya, Tanzania, Uganda, and South Africa. Paper prepared for the Centre for Study of African Economies 2013 Conference, Oxford
- Amin, M., and Ranjan, P. (2008). *When does legal origin matter?*, Washington, DC: World Bank
- Cummings, R. G., Martínez-Vázquez, J., McKee, M. and Torgler, B. (2009). Tax Morale affects Tax Compliance: Evidence from Surveys and an Artefactual Field Experiment. *Journal of Economic Behavioural Organization*, 70 (3): 447-457.

- D'Arcy, M. (2011). Why do citizens assent to pay tax? Legitimacy, taxation and the African state. *Afrobarometer Working Paper* No. 126.
- Daude, C., and Melguizo, A. (2010), Taxation and More representation? On Fiscal Policy, Social Mobility and Democracy in latin America. *OECD Development Centre Working Paper* 294, Paris
- Elster, J. (1989). Social Norms and Economic Theory. *The Journal of Economic Perspectives*, 3(1), 99-117.
- Eriksen, K., and Fallan, L. (1996). Tax knowledge and attitudes towards taxation: A report on a quasi-experiment. *Journal of Economic Psychology*, 17, 387–402.
- Fatás, E., and Roig, J. (2004). Equidad y evasión fiscal. Un test experimental. *Revista de Economía Aplicada*, pp. 17–37
- Fenochietto, R. and Pessino, C. (2013). Understanding countries tax effort. *IMF Working Paper*, WP/13/244
- Frey, B. S. (2003). The Role of Deterrence and Tax Morale in Taxation in the European Union. Jelle Zijlstra Lecture, Netherlands Institute for Advanced Study in the Humanities and Social Sciences (NIAS).
- Frey, B. S. and Torgler, B. (2007). Tax morale and conditional cooperation. *Journal of Comparative Economics* 35: 136-159
- Gaechter, S. (2006). Conditional cooperation: Behavioural regularities from the lab and the field and their policy implications. *Discussion Papers 2006-03, CeDEx*. University of Nottingham
- Gaviria, A. (2007). Social Mobility and Preferences for redistribution in latin America. *Economía*, 8 (1): 55-88.
- Gordon, J. (1989). Individual morality and reputation costs as deterrents to tax evasion. *European Economic Review*, 33, 797–805
- Gujarati, D. N. (2004). *Basic Econometrics*. 4<sup>th</sup> edition. McGraw-Hill Companies
- Harris, T.D. (1989). The effect of type of tax knowledge on individuals' perceptions of fairness and compliance with the federal income tax system: An empirical study. PhD Thesis, University of South Carolina.
- Ho, D., Ho, D.K. and Young, A. (2013). A study of the impact of culture on tax compliance in China. *International Tax Journal*, 39(3), 33 – 44.
- Hug, S., and Sporri, F. (2011). Referendums, Trust, and Tax Evasion. *European Journal of Political Economy*, 27 (1): 120-131.
- IMF (2011). Revenue mobilization in developing countries. *Policy Paper prepared by the Fiscal Affairs Department (8 March)*. Washington D.C.: International Monetary Fund.

- James, S., and Alley, C. (2004). Tax Compliance, self-assessment and tax administration. *Journal of Finance and Management in Public Services*, 2(2), 27-42.
- Jayawardane, D. (2016). Taxpayer attitude and tax compliance decision in Sri Lanka. *International Journal of Arts and Commerce*, 5(2), 124.
- Kar, D. and LeBlanc, B. (2013). Flows from Developing Countries: 2002-2011. *Global Financial Integrity*.
- Kirchler, E. (2007). *The Economic Psychology of Tax Behaviour*. Cambridge: Cambridge University Press.
- Knack, S., and Keefer, P. (1997). Does Social Capital Have an Economic Payoff? A Cross-country Investigation. *Quarterly Journal of Economics*, 112, pp 1251-88.
- Levi, M. 1988. *Of rule and revenue*, Berkeley: University of California Press
- Levi, M., and Sacks, A. (2009). Legitimizing beliefs: Sources and Indicators. *Regulation & Governance*, 3(4): 311-333.
- Lewis, A. (1982). *The Psychology of Taxation*. Oxford: Martin Robertson
- Luttmer, Erzo, F.P., and Singhal, M. (2014). Tax Morale. *Journal of Economic Perspectives*, 28(4), 149-168
- Mascagni, G., Moore, M., and McCluskey, R. (2014). *Tax revenue mobilisation in developing countries: Issues and challenges*. Luxembourg: European Union
- Mohamad Ali, A., Mustafa, H., and Asri, M. (2007). The effects of knowledge on tax compliance behaviours among malaysian taxpayers. *International Conference on Business and Information*, July 11-13, Tokyo, Japan.
- OECD (2008). Monitoring Taxpayers` Compliance: A Practical Guide Based on Revenue Body Experience.
- OECD-DAC (2012). Tax and development. Aid modalities for strengthening tax systems. Paris: Organisation for Economic Co-Operation and Development (August).
- Palil, Mohd Rizal, & Ahmad Fariq Mustapha. (2011). Determinants of Tax Compliance in Asia: A case of Malaysia. *European Journal of Social Sciences*, 24(1), 7-32.
- Pommerehne, W., and Weck-Hannemann, H. (1996). Tax rates, tax administration and income tax evasion in Switzerland. *Public Choice*, 88(1), 161-170
- Prinz, A. (2010). A Moral Theory of Tax Evasion. *Working Paper (2010)*, University of M"unster.
- Schneider, F., Buehn, A. and Montenegro, C.E. (2010). New Estimates for the Shadow Economies all over the World. *International Economic Journal*, 24: 443-461

- Singh, V. (2003). *Malaysian Tax Administration*. 6th ed. Kuala Lumpur: Longman
- Spicer, M.W. and Lundstedt, S.B. (1976). Understanding tax evasion. *Public Finance*, 31(2), 295-305.
- Stotsky, J. G. and Asegedech, W. Mariam. (1997). Tax Effort in Sub-Saharan Africa. *IMF Working Paper*, Washington, DC.
- Tittle, C. (1980). Sanctions and social deviance: The question of deterrence. *New York: Praeger*
- Torgler, B. (2003). Tax Morale in Transition Countries. *Post-Communist Economies*, 15 (3): 357-381.
- Torgler, B. (2004). Tax Morale in Asian Countries. *Journal of Asian Economics*, 15 (2): 237-266.
- Torgler, B. (2005). Tax Morale in Latin America. *Public Choice*, 122 (1/2): 133-157.
- Torgler, B., and Schneider, F. (2007). What shapes attitudes toward paying taxes? Evidence from multicultural European countries. *Social Science Quarterly*, 88(2), 443-465
- Traxler, C. (2010). Social Norms and Conditional Cooperative Taxpayers. *European Journal of Political Economy*, 26:89–103.
- Uslaner, E. (2008). Tax Evasion, Corruption and the Social Contract in Transition. Department of Government and Politics. Mimeo. University of Maryland-College Park.
- Wooldridge J.M. (2009). *Introductory Econometrics: A Modern Approach*. 4<sup>th</sup> eds. Cengage Learning, Inc.
- Yitzhaki, S. (1974). A Note on Income Tax Evasion: A Theoretical Analysis. *Journal of Public Economics*, 3: 201-202.

## Appendix

**Table A1: List of Countries**

Benin	Mali
Botswana	Mauritius
Burkina Faso	Mozambique
Burundi	Namibia
Cameroon	Niger
Cape Verde	Nigeria
Cote d'Ivoire	Senegal
Ghana	Sierra Leone
Guinea	South Africa
Kenya	Swaziland
Lesotho	Tanzania
Liberia	Togo
Madagascar	Uganda
Malawi	Zambia
	Zimbabwe

**Table A2: Definition of Variables**

Variable Name	Definition
Tax compliance	The action of people who do not pay taxes on their income. Measured on a scale of 1 – 3, where 1 represents <i>not wrong at all</i> , 2 is <i>wrong but understandable</i> and 3 is <i>wrong and punishable</i> . Recoded as dummy of “1” if the score is 3 and “0” if otherwise
<b>Non-Pecuniary Factors</b>	
Tax knowledge limitation	Difficulty to find out what taxes to pay measured on a scale of 1 – 4, where 1 represents <i>very easy</i> , 2 is <i>easy</i> , 3 is <i>difficult</i> and 4 is <i>very difficult</i> . Recoded as dummy of “1” if the score is either 3 or 4 and “0” if the score is either 1 or 2
Perceived non-compliance by others	The extent to which people avoid paying taxes they owe to the government measured on a scale of 0 – 3, where 0 represents <i>never avoid</i> , 1 represents <i>rarely avoid</i> , 2 represents <i>often avoid</i> and 3 is <i>always avoid</i> . Recoded as dummy of “1” if the score is either 2 or 3 and “0” if the score is either 0 or 1
Corruption	Corruption by tax officials measured on a scale of 0-3,

where 0 represents *none*, 1 is *some of them*, 2 is *most of them* and 3 is *all of them*. Recoded as dummy of “1” if the score is either 2 or 3 and “0” if the score is either 0 or 1

Trust in tax department	To what extent do respondent trust the tax department measured on a scale of 0 – 3, where 0 represents <i>not at all</i> , 1 is <i>just a little</i> , 2 is <i>somewhat</i> and 3 is <i>a lot</i> . Recoded as dummy of “1” if the score is either 2 or 3 and “0” if the score is either 0 or 1
Trust in courts	To what extent do respondent trust in the courts measured on a scale of 0 – 3, where 0 represents <i>not at all</i> , 1 is <i>just a little</i> , 2 is <i>somewhat</i> and 3 is <i>a lot</i> . Recoded as dummy of “1” if the score is either 2 or 3 and “0” if the score is either 0 or 1
Fighting corruption	The extent to which government is committed to fighting corruption measured on a scale of 1 – 4, where 1 represents <i>very badly</i> , 2 is <i>fairly badly</i> , 3 is <i>fairly well</i> and 4 represents <i>very well</i> . Recoded as dummy of “1” if the score is either 3 or 4 and “0” if the score is either 1 or 2
Health provision	To what extent is the government handling the provision of health needs measured on a scale of 1 – 4, where 1 represents <i>very badly</i> , 2 is <i>fairly badly</i> , 3 is <i>fairly well</i> and 4 represents <i>very well</i> . Recoded as dummy of “1” if the score is either 3 or 4 and “0” if the score is either 1 or 2
Education provision	To what extent is the government handling provision of educational needs measured on a scale of 1 – 4, where 1 represents <i>very badly</i> , 2 is <i>fairly badly</i> , 3 is <i>fairly well</i> and 4 represents <i>very well</i> . Recoded as dummy of “1” if the score is either 3 or 4 and “0” if the score is either 1 or 2
Road provision	To what extent is government handling provision of roads measured on a scale of 1 – 4, where 1 represents <i>very badly</i> , 2 is <i>fairly badly</i> , 3 is <i>fairly well</i> and 4 represents <i>very well</i> . Recoded as dummy of “1” if the score is either 3 or 4 and “0” if the score is either 1 or 2
Electricity provision	To what extent is the government handling the provision of reliable electric supply measured on a scale of 1 – 4, where 1 represents <i>very badly</i> , 2 is <i>fairly badly</i> , 3 is <i>fairly well</i> and 4 represents <i>very well</i> . Recoded as dummy of “1” if the score is either 3 or 4 and “0” if the score is either 1 or 2

### **Control Variables**

Difficulty in evading tax	Difficulty to evade paying taxes measured on a scale of 1 – 4, where 1 represents <i>very easy</i> , 2 is <i>easy</i> , 3 is <i>difficult</i> and 4 is <i>very difficult</i> . Recoded as dummy of “1” if the score is either 3 or 4 and “0” if the score is either 1 or 2
Age	Age of respondent
Male	Dummy=1 if respondent is a male
Education	The highest level of education measure on a scale of 0 – 9, where 0 represents <i>no formal schooling</i> and 9 is <i>postgraduate</i> . Recoded as “1” if score is 0 or 1, “2” if score is 2 or 3, “3” if score is 4 or 5 and “4” if score is 6-9
Rural	Dummy=1 if respondent is located in a rural area
Employment status	Dummy=1 if respondent is employed

### **Regional Fixed Effect**

WA	Dummy=1 if respondent is located in West Africa
EA	Dummy=1 if respondent is located in East Africa
SA	Dummy=1 if respondent is located in Southern Africa

### **Country-level variables**

Rule of law	Captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Data from World Governance Indicators (WGI)
Regulatory quality	Captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Data from WGI
Government effectiveness	Captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Data from WGI
GDP per capita	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus

any product taxes and minus any subsidies not included in the value of the products. Data are in constant 2010 U.S. dollars. Data from World Development Indicators (WDI)

Inflation Measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. Data from WDI

**Table A3 Descriptive Statistics of Variables**

<b>Variable name</b>	<b>Number of observations</b>	<b>Mean</b>	<b>Standard deviation</b>
Tax compliance	42,641	0.501	0.500
Tax knowledge limitation	42,641	0.643	0.479
Perceived non-compliance by others	42,641	0.288	0.453
Corruption	42,641	0.363	0.481
Trust in tax department	42,641	0.447	0.497
Trust in courts	42,641	0.617	0.486
Fighting corruption	42,641	0.355	0.479
Health	42,641	0.602	0.489
Education needs	42,641	0.629	0.483
Roads	42,641	0.458	0.498
Electricity	42,641	0.372	0.483
Difficulty in avoiding tax	42,641	0.712	0.453
Age	42,641	37.069	14.519
Male	42,641	0.506	0.500
No school	42,641	0.196	0.397
Primary	42,641	0.320	0.467
Secondary	42,641	0.366	0.482
Tertiary	42,641	0.116	0.321
Rural	42,641	0.614	0.487
Employment status	42,641	0.331	0.471

**Table A4: Correlation Matrix for Dependent and Independent Variables**

	TC	KN	DF	PNA	COR	TTD	TIC	FC	HE	EN	RD	EL	AGE	M	EDU	RUL	EMP
<b>TC</b>	1.00																
<b>KN</b>	-0.068	1.00															
<b>DF</b>	0.008	0.338	1.00														
<b>PNA</b>	-0.003	-0.006	-0.035	1.00													
<b>COR</b>	-0.035	0.081	0.042	0.077	1.00												
<b>TTD</b>	0.072	-0.060	0.011	-0.035	-0.178	1.00											
<b>TIC</b>	0.021	-0.044	-0.008	-0.065	-0.133	0.364	1.00										
<b>FC</b>	0.058	-0.043	-0.018	0.009	-0.098	0.174	0.154	1.00									
<b>HN</b>	0.058	-0.049	-0.008	-0.046	-0.066	0.109	0.134	0.248	1.00								
<b>EN</b>	0.058	-0.044	-0.018	-0.044	-0.063	0.115	0.134	0.223	0.535	1.00							
<b>RD</b>	0.079	-0.039	0.006	0.017	-0.045	0.119	0.095	0.254	0.285	0.268	1.00						
<b>EL</b>	0.075	-0.073	-0.010	0.019	-0.085	0.143	0.091	0.251	0.263	0.251	0.427	1.00					
<b>AGE</b>	0.036	-0.034	-0.003	-0.038	-0.054	0.045	0.030	-0.003	-0.022	-0.011	-0.022	-0.017	1.00				
<b>M</b>	0.027	0.001	0.025	0.026	0.033	0.043	0.011	0.015	-0.001	-0.008	-0.003	0.004	0.109	1.00			
<b>EDU</b>	0.042	-0.125	-0.076	0.103	0.064	-0.090	-0.107	-0.086	0.020	-0.008	0.060	0.060	-0.246	0.118	1.00		
<b>RUL</b>	-0.052	0.053	0.012	-0.111	-0.032	0.019	0.072	-0.001	0.001	0.010	-0.118	-0.137	0.069	0.005	-0.333	1.00	
<b>EMP</b>	-0.004	-0.015	0.031	0.028	0.021	0.016	0.005	-0.023	0.020	0.008	0.038	0.074	-0.005	0.116	0.246	-0.109	1.00
	TC	Tax compliance															
	KN	Tax knowledge limitation															
	DF	Difficulty in avoiding tax															
	PNA	Perceived non-compliance by others															
	COR	Corruption of tax officials															
	TTD	Trust in tax department															
	TIC	Trust in courts															
	FC	Fighting corruption															
	HN	Health provision															
	EN	Education provision															
	EL	Electricity provision															
	AGE	Age															
	M	Male															
	EDU	Education															
	RUL	Rural															
	EMP	Employment status															

**Table A5. Results for robustness checks**

Dependent variable: tax compliance							
Variable	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Lngdp per capita	-	-	0.025*** (0.003)				
Inflation	-	-	-	-0.003*** (0.001)			
Government efficiency	-	-	-	-	0.044*** (0.006)		
Rule of law	-	-	-	-	-	0.025*** (0.006)	
Regulatory quality	-	-	-	-	-	-	0.078*** (0.006)
Tax knowledge limitation	-0.051*** (0.006)	-0.048*** (0.006)	-0.057*** (0.006)	-0.058*** (0.006)	-0.056*** (0.006)	-0.059*** (0.006)	-0.054*** (0.006)
Perceived noncompliance by others	-0.022*** (0.007)	-0.020*** (0.006)	-0.031*** (0.006)	-0.032*** (0.006)	-0.031*** (0.006)	-0.031*** (0.006)	-0.031*** (0.006)
Corruption	-0.020*** (0.006)	-0.019*** (0.006)	-0.015** (0.006)	-0.017*** (0.006)	-0.013** (0.006)	-0.014** (0.006)	-0.009 (0.006)
Trust in tax department	-0.045*** (0.006)	-0.042*** (0.006)	0.049*** (0.006)	0.049*** (0.006)	0.047*** (0.006)	0.049*** (0.006)	0.046*** (0.006)
Trust in courts	0.004 (0.007)	0.004 (0.006)	-0.007 (0.006)	-0.006 (0.006)	-0.009 (0.006)	-0.007 (0.006)	-0.008 (0.006)
Fighting corruption	0.023*** (0.007)	0.021*** (0.006)	0.024*** (0.006)	0.024*** (0.006)	0.023*** (0.006)	0.022*** (0.006)	0.024*** (0.006)
Health	0.018** (0.007)	0.017** (0.007)	0.030*** (0.007)	0.029*** (0.007)	0.030*** (0.007)	0.030*** (0.007)	0.032*** (0.007)
Education	0.026*** (0.007)	0.025*** (0.007)	0.028*** (0.007)	0.028*** (0.007)	0.028*** (0.007)	0.029*** (0.007)	0.030*** (0.007)
Road	0.021*** (0.007)	0.019*** (0.006)	0.043*** (0.006)	0.044*** (0.006)	0.042*** (0.006)	0.043*** (0.006)	0.038*** (0.006)

Electricity	0.010 (0.007)	0.009 (0.007)	0.015** (0.007)	0.024*** (0.006)	0.013* (0.007)	0.018*** (0.007)	0.006 (0.007)
Difficulty in avoiding tax	0.029*** (0.007)	0.026*** (0.006)	0.029*** (0.007)	0.026*** (0.007)	0.028*** (0.007)	0.028*** (0.007)	0.028*** (0.007)
Age	0.001*** (0.0002)	0.001*** (0.0002)	0.001*** (0.0002)	0.001*** (0.0002)	0.001*** (0.0002)	0.001*** (0.0002)	0.001*** (0.0002)
Male	0.023*** (0.006)	0.021*** (0.006)	0.022*** (0.006)	0.021*** (0.006)	0.022*** (0.006)	0.021*** (0.006)	0.022*** (0.006)
Education							
Primary	0.051*** (0.009)	0.048*** (0.009)	0.014 (0.009)	0.021** (0.009)	0.017** (0.009)	0.016* (0.009)	0.019** (0.009)
Secondary	0.064*** (0.010)	0.061*** (0.009)	0.033*** (0.009)	0.043*** (0.009)	0.040*** (0.009)	0.042*** (0.009)	0.044*** (0.009)
Tertiary	0.097*** (0.012)	0.092*** (0.012)	0.073*** (0.011)	0.082*** (0.011)	0.081*** (0.011)	0.082*** (0.011)	0.086*** (0.011)
Rural	-0.017*** (0.007)	-0.016*** (0.006)	-0.012** (0.006)	-0.015** (0.006)	-0.012* (0.006)	-0.014** (0.006)	-0.010 (0.006)
Employment status	-0.015** (0.007)	-0.014** (0.006)	-0.021*** (0.006)	-0.014** (0.006)	-0.022*** (0.006)	-0.020*** (0.006)	-0.025*** (0.006)
Regional effect	YES	YES	YES	YES	YES	YES	YES
Weight	YES	YES	YES	YES	YES	YES	YES
Observations	42,641	42,641	42,641	42,641	42,641	42,641	42,641
Prob(F-Statistic)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

---

NB: Tabulates are marginal effect coefficient. Robust Standard errors in parenthesis are clustered around country. \*\*\*, \*\*, \* signifies significance level of 1%, 5% and 10% respectively. All regressions include constant term (not shown)

---