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Tax Morale and Trust in Public Institutions

Wilfred Anicet KOUAMÉ

UNIVERSITÉ DE SHERBROOKE

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Wilfried Anicet Kouamé*

Université de Sherbrooke

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Abstract

One significant puzzle in economics is to explain why people pay their taxes and why there are so many differences in tax compliance across countries. Tax morale literature has sought to tackle this puzzle with a sparse evidence from the relationship between taxpayers and public authorities. This paper sheds light on an important channel whereby trust in public institutions raises taxpayers' willingness to comply. The theoretical framework goes beyond the standard model of tax evasion by allowing both social norms and the interactions with public institutions. The empirical approach uses the World Values Survey 2010-2014 to show the evidence that trust in public institutions increases tax morale. The findings suggest that in both advanced and developing countries, trust in public institutions is a key determinant of tax morale along with the social norms about tax compliance. The paper addresses endogeneity issues between tax morale and trust in public institutions using the historical data on slavery at the ethnic group level and the taxpayers voting behavior. The findings are robust using alternative identification strategy and additional control variables.

JEL codes: D700; H260; H310; K420

Keywords: Tax morale, tax evasion, trust in public institutions.

1 Introduction

In developed and developing countries alike, the answer to the question "why do people pay tax?" remains a key challenge for both economic theory and policymakers. Allingham and Sandmo (1972) were the first to attempt to answer this question by developing the standard model of tax evasion[1]. This model has been broadly criticized because of the incompatibility between its predictions and the actual tax evasion. Indeed in many countries, the actual level of deterrence is too low to explain the high degree of tax compliance[2] (Cummings et al., 2009; Andreoni et al., 1998; Alm et al., 1992). A large part of the literature identifies mainly horizontal relationship like norms, values, religiosity, culture, and history as factors that could explain the taxpayer's willingness to pay his taxes. Besley et al. (2015), Bénabou and Tirole (2011) and Myles and Naylor (1996) show for example that the intrinsic motivation of taxpayers to pay their taxes is affected by social norms. Using the World Value Survey (WVS), Alm and Torgler (2006) show that cultural differences between the United States and Europe explain the difference in tax morale. Also, through the analysis of a tax reform under Margaret Thatcher's government in the UK during the early 1990s, Besley et al. (2015) show the evidence that temporary shocks affect the willingness to comply. Fischbacher et al. (2001), Fortin et al. (2007), and Frey and Torgler (2007) find evidence of conditional cooperation that taxpayers contribute to public goods according to others' contributions. Finally, Torgler (2006) shows strong evidence that religiosity affects tax morale.

However, evidence from vertical relationship (interactions with public authorities) are rather sparse.[3] Smith and Stalans (1991) were one of the first to show that positive actions of states tend to improve attitudes and commitments of the taxpayer against tax system.

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[1]In this model, deterrence policies (probability of detection and degree of punishment) determine the extent of tax evasion.

[2] According to Andreoni et al. (1998) the likelihood of being audited in the United States for taxpayers was 1.7 percent. The civil penalty for underpayment of taxes is 20 percent of the underpayment for a specified misconduct (negligence, substantial understatements, substantial valuation misstatement, etc.) and 75 percent for fraud (intentional wrongdoing).

[3]To the best of our knowledge, the only papers analyzing the vertical relationship are Frey and Torgler (2007), Ahmed and Braithwaite (2004), Slemrod (2002), Scholz and Lubell (1998), Pommerehne et al. (1994), and Smith and Stalans (1991)

Pommerehne et al. (1994) confirmed this result using a simulation study design to analyze the impact of fiscal exchange on tax compliance. These authors show that the more there are discrepancies between the optimal choice of public good, the level and the real quantity supplied, the more tax evasion is high. Scholz and Lubell (1998) and Slemrod (2002) corroborate these findings showing that trust in government declines the acceptability of tax evasion. However, Scholz and Lubell (1998) confined their analysis only to the confidence in government and to the United-States framework. Slemrod (2002) uses a comparative framework between West Germany and United-States and limits the analysis to a simple correlation between confidence in government and tax evasion acceptance. Using a group analysis, Ahmed and Braithwaite (2004) show that tax evasion is significantly higher in the group of taxpayers who have lost confidence in government. Finally, Frey and Torgler (2007) analyze at the macro level the relationship between tax morale and the quality of institutions. However, these authors evoke neither trust in public institutions, neither the potential endogenous issue between tax morale and the quality of institutions.

This paper differs from those above in, at least, three ways. First, the paper integrates the relationship between taxpayer and public institutions in the standard model of tax evasion. Second, it focuses on the overall confidence in public institutions. Finally, the paper provides an explanation to studies showing that participative democracy (Pommerehne and Weck-Hannemann, 1996; Pommerehne, 1978; Torgler, 2005), fiscal autonomy and decentralization (Güth et al., 2005) increase tax morale. This paper highlights that the improvement in trust in public institutions is the mechanism through which decentralization, local autonomy, direct democratic right and fiscal autonomy raise tax morale. I argue that the relationship between the taxpayers and public authorities can be perceived as a psychological or implicit contract. This contract might be based on trust and involves a rewards system, punishments, loyalty and mutual expectation. Opportunistic behavior like cheating on taxes can, therefore, be a way for taxpayers to express their satisfaction or discontent with the way public resources are managed. Indeed, as argued by Scholz and Lubell (1998) without trust the potential benefits of collective actions will depend solely on altruism and enforcement mechanisms that ensure

that the profits of opportunistic behaviors are lower than the costs associated with deviation. Trust, therefore, plays an important role in maintaining credibility and enhances social capital by reducing monitoring and costly sanctions (Coleman, 1994; Ostrom, 1990).

Potential endogeneity issues between tax morale and trust in public institutions are addressed using the instrumental variables (IV) methods. The identification strategy relies on the historical data on slavery at the tribe level and a variable capturing the taxpayer voting behaviors. The slavery data are from Murdock (1959) who documents the number of slaves exported by the ethnic group during both the transatlantic and the Indian Ocean slave trade. I first match these historical data with the ethnic group of each respondent in the WVS. I then generate a dummy variable that takes 1 if a positive number of the slave has been exported in the corresponding ethnic group and 0 otherwise. As argued by Nunn and Wantchecon (2011), the slave of trade caused a culture of mistrust, which may persist to this day. The slaves were captured through state-organized raids and warfare, and a ubiquitous environment of insecurity caused individuals to turn on other (Piot, 1996). I hypothesize that the slavery origin may persist to this day and alter the trust in public institutions. The historical character of this database provides a solid basis for the instrument's exogeneity and guarantee that the exclusion restriction is satisfied. I use as an additional instrument the taxpayer's voting behavior during the national election. The underline intuition is that taxpayers who always vote during national elections are more likely to trust public institutions or the ability of their vote to improve the quality of the institutions. As previously, this instrument seems to satisfy exclusion restriction condition. Outside the trust in public institutions channel, there is no apparent reason for which voting during a national election can directly affect tax morale. Using two instruments for one endogenous variable makes it possible to assess and validate the restriction exclusion condition in addition to the weak identification test.

The findings can be summarized as follows. Trust in public institutions raises taxpayers willing to pay their taxes in both advanced and developing countries. In both groups of countries, taxpayers social norms about tax compliance appear to play also a key role on tax

morale. The findings are robust to additional control variables, alternative methodology, and sub-categorization of the trust in public institutions.

The next section presents the theoretical model. Section 3 presents empirical supporting evidence of the impact of trust in public institutions on tax morale consistent with testable predictions of the model. Section 4 checks the sensitivity of the findings. Section 5 provides some concluding remarks.

2   Theoretical Approach

2.1   Standard model

The standard model of tax evasion is based on Allingham and Sandmo (1972) and Yitzhaki (1974) papers. In this model, the taxpayer i has at each period an exogenous income Y_i, that is not known by tax administration. The taxpayer declares to the tax administration an income D on which a tax τ is levied. I assume in this paper that the taxpayer chooses a share ϑ of his income Y_i that he escapes i.e $D_i = (1 - \vartheta_i)Y_i$.

Let f be the fine paid by the taxpayer if his tax evasion activities are discovered. In this case, the taxpayer expected income can be written as follows:

$$Y_{ai} = Y_i - \tau(1 - \vartheta_i)Y_i - f\tau\vartheta_i Y_i$$

However, the taxpayer's income if he is not discovered will be:

$$Y_{ni} = Y_i - \tau(1 - \vartheta_i)Y_i$$

At each period, the taxpayer chooses the level of tax evasion ϑ that maximizes his expected utility :

$$\max_{\vartheta_i} \quad Eu_i(Y_i) = pu_i(Y_{ai}) + (1 - p)u_i(Y_{ni}) \tag{1}$$

where, p is the detection probability.

$$\max_{\vartheta_i} \quad Eu_i(Y_i) = pu_i[Y_i - \tau(1 - \vartheta_i)Y_i - f\tau\vartheta_iY_i] + (1 - p)u_i[Y_i - \tau(1 - \vartheta_i)Y_i] \qquad (2)$$

I assume that the taxpayer is risk averse, hence his private utility $u_i()$ is increasing and concave in consumption.

The first order will be

$$\frac{\partial Eu_i(Y_i)}{\partial \vartheta_i} = 0 \Rightarrow p(1 - f)\tau Y_i u'_i(Y_{ai}) + (1 - p)Y_i\tau u'_i(Y_{ni}) = 0$$

The optimal level of tax evasion can be obtained from Kuhn-Tucker conditions and be written as :

$$\vartheta_i^* = \vartheta_i^*(\tau, f, p, Y_i) \qquad (3)$$

where, c is the country index.

Thus, according to Allingham and Sandmo (1972)'s model the proportion of evaded income depends on the extent of deterrence policies like detection probabilities and fines. This means that an increase in detection probabilities p or on the fine f declines tax evasion.

However, considering the weakness of actual detection policies (low detection probabilities and weak fine), we should observe a higher tax evasion than there really is (Alm et al., 1992). Indeed, this standard model takes into account neither taxpayers perception about public services i.e. transparency and fairness (Cummings et al., 2009), nor the way in which public expenditures are determined (Alm et al., 1993)[4], nor the way in which application rules are determined (Alm et al., 1999), nor the social norms (Besley et al., 2015; Bénabou and Tirole, 2011; Myles and Naylor, 1996) and the collective actions (Naylor, 1989).

The next section extends the standard model of tax evasion by taking into account both the role of trust in public institutions and social norms about tax morale.

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[4]Alm et al. (1993) find for example that tax morale is higher when public goods are voted rather than when they are imposed.

2.2 Inclusion of vertical and horizontal relationship

Based on Brock and Durlauf (2001)[5] and Fortin et al. (2007)[6], I include an individual institutional utility function in the taxpayer private utility function. More specifically, this model presents a general framework in which there are both social interaction function $S_i(\vartheta_i, Z_i)$ and institutional interaction function $A_i(\vartheta_i, X_i)$. The latter depends on the share of income evaded ϑ_i and respectively on a set of variables Z_i and X_i. I assume that individual social and institutional interactions functions are linear in ϑ_i[7]. This assumption entails that the marginal social and institutional functions depends only on variables X_i and Z_i.

Taxpayers' expected utility will be :

$$EV_i(Y_i) = Eu_i(Y_i) + S_i(\vartheta_i, Z_i) + A_i(\vartheta_i, X_i)$$

The first component is the private expected utility associated with tax morale, corresponding to expected utility in the standard model of tax evasion. The second and the third components are respectively social and institutional utility associated to tax morale.

$$S_i(\vartheta_i, Z_i) = s_i(Z_i)(1 - \vartheta_i)Y_i$$

$$A_i(\vartheta_i, X_i) = a_i(X_i)(1 - \vartheta_i)Y_i$$

$s_i(Z_i)$ and $a_i(X_i)$ are respectively social and institutional marginal utility associated to tax morale. The expected utility function can be written as

$$EV_i(Y_i) = pu_i[Y_i - \tau(1 - \vartheta_i)Y_i - f\tau\vartheta_i Y_i] + (1 - p)u_i[Y_i - \tau(1 - \vartheta_i)Y_i] + [s_i(Z_i) + a_i(X_i)](1 - \vartheta_i)Y_i \quad (4)$$

where,

$$a_i(X_i) = a(T_i, \epsilon_i)$$

$$s_i(Z_i) = s_i(\bar{\vartheta}_i^e, K_i, \epsilon_i) \quad (5)$$

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[5]First paper which includes an individual social utility function in the private utility function.

[6]Fortin et al. (2007) apply Brock and Durlauf (2001)'s framework to the standard model of tax evasion by adding a social interactions function.

[7]Fortin et al. (2007) make the same assumption.

I assume that the marginal institutional utility of tax morale depends on trust in public institutions T_i and a random term ϵ_i that captures unobservable individual characteristics and attributes that are common to all individuals in the same community. The idea here is that the relationship between the taxpayer and the state can be assimilated in terms of a psychological or implicit contract. This contract involves a rewards system, punishments, loyalty and mutual expectation. Thus, if the taxpayer is satisfied with this relationship, his confidence in public institutions increases. In this case, the taxpayer intrinsic motivation to pay his taxes will be high. Thus, confidence in public institutions have a positive effect on tax morale i.e. the marginal institutional utility of tax morale is positive.

Regarding the marginal social utility of tax morale, I assume that it depends on individual subjective expectation of the mean of tax morale of co-citizens $\bar{\vartheta}_i^e$. As in Fortin et al. (2007), Myles and Naylor (1996) and Gordon (1989) a positive effect of $\bar{\vartheta}_i$ on tax morale corresponds to a social conformity effect. A negative effect corresponds to a social anti-conformity effect. In the latter case, the taxpayer's preferences indicate a pure free-riding behaviour.

Unlike Fortin et al. (2007), I suppose that public goods funded through taxes are fully take into account in individual utility[8]. The slackness of this assumption is justified by the inclusion of confidence in public institutions in tax evasion model. Indeed, the implicit contract between the taxpayer and the state requires the provision of desirable level of public good (quality and quantity). Thus, dissatisfaction with public services and expenditures causes deterioration of taxpayers' trust in public institutions. Also, the signals sent by the public institutions (failure, wastage, inefficiency, corruption, abuse of power) affect the taxpayer confidence in public institutions.[9]

Assuming that preferences satisfy Von Neumann-Morgenstern axioms, the taxpayer problem can be write as:

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[8]Many papers like Spicer and Lundstedt (1976), Alm et al. (1992) make the same assumption.

[9]The impact of distortionary infrastructure on tax evasion is extensively discussed in Kouamé and Goyette (2017).

$$\max_{\vartheta} EV_i(Y_i) = pu_i[Y_i - \tau(1-\vartheta_i)Y_i - f\tau\vartheta_i Y_i] + (1-p)u_i[Y_i - \tau(1-\vartheta_i)Y_i] + [s(Z_i) + a(X_i)](1-\vartheta_i)Y_i$$

$$s/c$$

$$0 \leq \vartheta_i \leq 1$$

$$a_i(X_i) = a_i(T_i, \epsilon_i)$$

$$s_i(Z_i) = s_i(\bar{\vartheta_i}^e, K_i, \epsilon_i)$$

$$(6)$$

First-order conditions are:

$$p(1-f)\tau Y u_i'[Y_i - \tau(1-\vartheta_i)Y_i - f\tau\vartheta_i Y_i] + (1-p)Y_i\tau u_i'[Y_i - \tau(1-\vartheta_i)Y_i] - [a_i(T_i,\epsilon_i) + s(\bar{\vartheta_i}^e, K_i, \epsilon_i)]Y_i = 0$$

Using the Kuhn-Tucker conditions, the optimal level of tax evasion will be:

$$\vartheta_i^* = \vartheta_i^*(\tau_c, f_c, p_c, T_i, \bar{\vartheta_i}^e, K_i, \epsilon_i)$$

where, i and c are respectively individual and countries index.

I assume that the taxpayer's expectations are self-consistent i.e. they are based on the contemporary observations. In this case, the Nash equilibrium is characterized by $\bar{\vartheta_i}^e \cong \bar{\vartheta_i}$ i.e. the expected perception of the average tax morale of the co-citizens equals to the average tax morale. Thus, the optimal level of tax evasion can be write as,

$$\vartheta_i^* = \vartheta_i^*(\tau_c, f_c, p_c, T_i, \bar{\vartheta_i}, K_i, \epsilon_i) \tag{7}$$

By taking the total derivatives of tax evasion relative to trust in public institutions, mean of tax evasion, fine, detection probability, we have:

$$\frac{d\vartheta_i}{dT_i} = \frac{\frac{\partial a_i(T_i,\epsilon_i)}{\partial T_i}}{(\tau Y)^2[p(1-f)^2 u_i''(Y_{ai}) + (1-p)u_i''(Y_{ni})]} \tag{8}$$

$$\frac{d\vartheta_i}{d\bar{\vartheta}_i} = \frac{\frac{\partial s_i(\bar{\vartheta}_i, K_i, \epsilon_i)}{\partial \bar{\vartheta}_i}}{(\tau Y)^2 [p(1-f)^2 u_i''(Y_{ai}) + (1-p)u_i''(Y_{ni})]} \tag{9}$$

$$\frac{d\vartheta_i}{df_c} = \frac{p(1-f)\tau Y u''(Y_a)}{(\tau Y)^2 [p(1-f)^2 u''(Y_a) + (1-p)u''(Y_n)]} \tag{10}$$

$$\frac{d\vartheta_i}{dp_c} = \frac{(f-1)\tau u'(Y_a) + \tau Y u'(Y_n)}{(\tau Y)^2 [p(1-f)^2 u_i''(Y_{ai}) + (1-p)u_i''(Y_{ni})]} \tag{11}$$

From this model and expression above, we can draw four predictions regarding tax evasion:

1. $\frac{d\vartheta_i}{dT_i} \leq 0$

2. $\frac{d\vartheta_i}{d\bar{\vartheta}_i} \geq 0$

3. $\frac{d\vartheta}{dp} \leq 0$

4. $\frac{d\vartheta}{df} \leq 0$

Prediction 1 indicates that an increase of trust in public institutions would reduce tax evasion. This means that the more taxpayers' confidence in public institutions is high, the higher their intrinsic motivation to pay taxes will be. This result can be explained by the fact that confidence in public institutions reflects taxpayer's satisfaction about the implicit contract between him and the state.

Prediction 2 states that an increase in the mean of tax evasion of the community raises individual tax evasion. I assume that the mean of community's tax evasion reduces the taxpayer' private social marginal utility[10]. The predictions highlight therefore a "social conformity effect" i.e. the taxpayer has an incentive to comply if paying taxes is a social norm. **Predictions 3 and 4** state respectively that an increase in both detection probability and fines reduces tax evasion. The last two predictions are exactly the same as in Allingham and Sandmo (1972) model.

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[10]This mean that $\frac{\partial s(\bar{\vartheta}_i, K_i, \epsilon_i)}{\partial \bar{\vartheta}_i} \leq 0$. In the specific case where the mean of community's tax evasion increases the taxpayer private social marginal utility, the taxpayer adopts a strategic substitutability behaviour (anti-social conformity effect).

3 Empirical Approach

In this section, we estimate the relationship between trust in public institutions and tax morale using equation (7) above. From the theoretical model to the empirical approach, I assimilate tax evasion to tax morale. This choice is justified by the availability of data on tax morale from the WVS, unlike data on tax evasion that are scant at the taxpayers level. Moreover, while there is a difference between tax evasion and tax morale, the latter seems to be a good proxy of tax evasion activities as poor tax morale involves a corresponding level of tax evasion and vice versa and has been extensively used in the literature.[11] The next section presents the database and variables before discussing the findings.

3.1 Data and variables

The empirical approach uses the data from the sixth wave of the World Value Survey (WVS), which covers 52 countries[12] from 2010 to 2014. In the survey, respondents are interviewed on their attitudes concerning economic and social contemporary issues, family, religion, and work. The WVS are widely used in political economics, sociology and economy in many papers whose Knack and Keefer (1997), Slemrod (2002), Zak and Knack (2001), and Nunn and Wantchecon (2011). Moreover, using the experimental data of the *Reader's Digest*[13], Knack and Keefer (1997) provide an empirical proof of the validity of these data. Indeed, they show the existence of a strong correlation between the measure of trust in the WVS and the number of wallets lost and returned with their content intact in many countries.

The econometric analysis is based on the linearized form of the latent tax morale from equation (7) :

$$\vartheta_{ilc} = \alpha T_{ilc} + \beta \bar{\vartheta_{ilc}} + \gamma K_{ilc} + \eta_c + \epsilon_{ilc} \tag{12}$$

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[11]Frey and Torgler (2007), Torgler (2006) and Torgler (2005) use this variable as a measure of tax morale, while Slemrod (2002), uses it as a measure of tax evasion.

[12]See table 8 for the list of countries

[13]This experimental study was conducted in several European countries and the United States. The experiment consisted of making lose in several cities, the wallets containing 50$ each with the owners' address and phone number. See *The Economist of 22 June 1996.*

where, i, l and c are respectively individual, location (city) and country indexes. ϑ^*_{ilc} is tax morale, T_{ilc} trust in public institutions, $\bar{\vartheta}_{ilc}$ the mean of tax morale in the taxpayer's community. K_{ic} is the taxpayer's individual characteristics and η_c the country fixed effects which capture country characteristics that do not vary from those taxpayers. In this model, I assume that fines and detection probability are the same for all taxpayers. These variables are therefore captured by the country fixed effects.

The general question for assessing the degree of tax morale is:

Please, tell me whether you think that cheating on tax, if you have the chance, can always be justified, never be justified, or something in between. (scale from 1=never justified to 10=always justified)

The dependent variable *tax morale* is obtained by recoding this question such as 10 represents the highest tax morale. The variable of interest, *trust in public institutions*, is obtained by taking the weighted average of confidence in government, parliament, the legal system, civil service, education system.[14] The question to obtain this variable is:

I am going to name a number of organizations. For each one (the legal system, the police, the government in your nation's capital, parliament, the civil service, the education system), could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all? (scale from 1=A great deal to 4=None at all).

The variable of interest is re-coded such as 4 indicates a great deal of confidence and 1 "not at all". The social norms on tax morale are measured by the average tax morale at the city level. Using the average limits endogeneity issues as the taxpayer is small relative to the community, reducing, therefore, the likelihood that his tax morale affects the one of the community. As discussed early, we expect a social conformity effects, i.e., a positive relationship between the social norms on tax morale and the taxpayer's tax morale. All

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[14]In a simple comparison between West of Germany and the United-States of America, Slemrod (2002) uses a similar variable. However, Slemrod (2002) is limited to four indicators (confidence in education and legal system, confidence in the police and the civil service). I go further in this paper to include trust in the parliament and government.

estimations include numbers of taxpayers' individual characteristics such as age, education, religion, employment status and type of employment, marital status, gender, economic class, financial satisfaction, the perception of opportunistic behaviors, and the sense of belonging to the country. The variable *age* is included to reflect the fact that individual tax morale may depend on age. According to the literature, I expect a positive or a non-significant effect of age on tax morale. Tittle (1980) and Friedman et al. (2000) show the evidence of positive effect of age on tax morale, while other papers like Spicer and Becker (1980) and Mason and Calvin (1984) find a non-significant effect of age on tax morale.

The variable *religious* controls for the taxpayers' beliefs. Like Torgler (2006), I expect that being religious increases tax morale. According to Spicer and Becker (1980), Tittle (1980) and the social psychological literature, women are more compliant than men. Hence, to take into account the impact of gender on tax morale, I include a gender variable, *gender*, which is equal to 1 if the taxpayer is a man and 0 otherwise. I control for the employment status by including dummy variables capturing whether the taxpayer is a full-time employee, part-time employee, self-employed, retired, housewife not otherwise employed, student or unemployed (reference group: other). Also, working in the public sector or the private sector may affect individual tax morale. Thus, I include two dummy variables *public employee* and *private employee* that indicate if the taxpayer works in the public or private sector.

I control also for marital status by including dummy variables (*single*, *living together*, *married*, *divorced*, *separated*) that indicate if the taxpayer is single, married, divorced, separated or living together (reference group: widow). Indeed, Tittle (1980) shows that the tax morale of married persons is higher than that of single persons. This evidence explains that married persons are more constrained by their social network than single persons. Based on the theory of aspiration or reference point[15], I take into account a financial satisfaction variable (*financial satisfaction*) to capture the effect of financial satisfaction on tax morale. The intuition is that the taxpayers who are least satisfied financially are more likely to engage in tax evasion because they aspire for a better financial situation. Similarly, the taxpayer's

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[15]See Simon (1955) and Kahneman and Tversky (1979)

economic class can affect his motivation to pay taxes. Hence, I include dummy variables, *upper class*, *uppermiddle class lower class* and *working class* (reference group: lower-middle class). The latter captures the impact of economic class on tax morale.

Finally, I control for the highest level of education attained by the taxpayer (*education*) and the use of a computer. The idea here is that the more the taxpayer is educated and/or use a computer, the better he knows the tax system (strengths and weaknesses) and the uses of collected resources through taxes. Thus, on the one hand, the taxpayer can use his knowledge to detect flaws and make tax evasion and, on the other hand, the taxpayer can have a higher motivation to pay his taxes because he better evaluates the benefits of collective action. As Lewis (1982) and Torgler (2006), I do not expect education to have a specific effect on tax morale, it can increase or decrease a taxpayer's tax morale. The perception of opportunistic behaviors is captured by two variables measuring whether the taxpayer finds stealing property and claiming government benefits to which he is not entitled never justifiable. Finally, we control for two variables capturing whether the taxpayer feels part of the country and pride to be a citizen of the country. For both variables, we expect the feeling of being part of the country and pride to be a citizen of the country to increase tax morale. All questions associated with these individual characteristics are presented in Appendix C.

3.2 Baseline estimations

To reflect the national distribution, all regressions use the weights from the survey. The dependent variable (*tax morale*) is a ranking information's between 1 and 10, hence ordered probit model is more relevant for estimations. However, following the literature, I present both the weighted ordered probit model and ordinary least squares (OLS). I explore potential heterogeneous effects by dividing the sample into two sub-groups: advanced and non-advanced countries. The underline intuition is to examine whether the difference in the quality of pre-established institutions affects the impact of trust in public institutions on tax

morale. Especially, in an area with good institutions, taxpayers may be more sensitive to the signal sent by the concerned institutions relative to an environment with a poor quality of institutions.

Columns (1) to (3) of table 1 report the marginal effects from the weighted ordered probit model using all the sample, the advanced countries, and the non-advanced countries respectively. In line with the literature[16], I report only the marginal effects for the highest value of tax morale, i.e., cheating on taxes is "never justified". The marginal effect indicates the change in the share of taxpayers belonging to a specific tax morale level when the independent variable increases by one unit. The findings show a positive and statistically significant relationship between tax morale and trust in public institutions. An increase in trust in public institutions by one unit raises the proportion of taxpayers stating that cheating on taxes is never justifiable by between 0.03 and 0.04 percentage points. The findings show also that the social norms on tax morale increase the willingness to comply by between 0.14 and 0.20. The findings are statistically significant at the 1 percent level. The results are consistent with the theoretical predictions of the model. Estimates from the OLS model reported in columns (4) to (6) corroborate these findings. In this model, social norms on tax morale and trust in public institutions still have positive and statistically significant effects on tax morale. The findings show no evidence of heterogeneous effects of the impacts of trust in public institutions on tax morale. Trust in public institutions increases taxpayers willing to pay their taxes in both sub-groups of countries, while the magnitude of the effects is higher advanced countries relative to emerging and developing countries. In both estimation model, age, find opportunistic behaviors never justifiable, and the sense of belonging to the nation are positively related to tax morale while being a male decline the taxpayer's willingness to comply.

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[16]See for instance Torgler (2006).

Table 1: Trust in public institutions and tax morale

Dependent variable: Tax morale	Weighted ordered probit			Weighted OLS			Weighted 2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trust in public institutions	0.0286*** (0.0062)	0.0389*** (0.0141)	0.0259*** (0.0072)	0.117*** (0.0239)	0.166*** (0.0454)	0.102*** (0.0282)	1.214*** (0.364)	1.523*** (0.501)	1.177*** (0.447)
Social norms on tax morale	0.1374*** (0.0152)	0.2070*** (0.0293)	0.1389*** (0.0151)	0.462*** (0.0501)	0.575*** (0.108)	0.468*** (0.0504)	0.461*** (0.0518)	0.452*** (0.0846)	0.472*** (0.0532)
Religious	0.0096 (0.0103)	0.0251** (0.0127)	-0.0026 (0.0139)	0.0107 (0.0341)	0.0456 (0.0335)	-0.0137 (0.0506)	-0.0394 (0.0515)	0.0126 (0.0466)	-0.0760 (0.0710)
Sense of belonging to the nation									
Feeling of being part of the nation	0.0213*** (0.0077)	0.0131 (0.0119)	0.0252*** (0.0088)	0.0473** (0.0228)	0.0112 (0.0294)	0.0612** (0.0283)	0.0433 (0.0419)	0.148** (0.0646)	0.0162 (0.0479)
Pride to be a citizen of the country	0.0401*** (0.0054)	0.0365*** (0.0084)	0.0399*** (0.0071)	0.134*** (0.0221)	0.0893** (0.0337)	0.157** (0.0276)	0.0160 (0.0409)	0.0700 (0.0697)	0.0417 (0.0470)
Employment status									
Full time employee	-0.0277 (0.0291)	-0.0682* (0.0368)	0.0090 (0.0768)	-0.0685 (0.0298)	-0.165* (0.0772)	0.0414 (0.105)	-0.0389 (0.114)	-0.272*** (0.0598)	0.133 (0.113)
Partial time employee	-0.0140 (0.0300)	-0.0380 (0.117)	0.0112 (0.0432)	-0.0494 (0.0318)	-0.111 (0.0863)	0.0401 (0.114)	-0.0231 (0.118)	-0.184** (0.0600)	0.114 (0.125)
Self-employed	-0.0403 (0.0307)	-0.0927* (0.0508)	-0.0050 (0.0297)	-0.123 (0.0848)	-0.218* (0.109)	-0.0244 (0.112)	-0.108 (0.114)	-0.287** (0.126)	0.0428 (0.112)
Unemployed	-0.0362 (0.0306)	-0.0440 (0.0391)	-0.0122 (0.0310)	-0.103 (0.0826)	-0.0797 (0.0885)	-0.0344 (0.111)	-0.0744 (0.125)	-0.0815 (0.110)	0.0434 (0.126)
Retired	-0.0191 (0.0353)	-0.0390 (0.0469)	-0.0195 (0.0341)	-0.0395 (0.0976)	-0.0789 (0.120)	-0.0689 (0.160)	-0.0335 (0.0816)	-0.195** (0.110)	0.132 (0.132)
Student	-0.126 (0.0788)	-0.1080*** (0.054)	-0.0053 (0.0553)	-0.150* (0.0864)	-0.281* (0.128)	-0.0268 (0.166)	-0.214* (0.137)	-0.513*** (0.137)	-0.0200 (0.105)
Home	-0.0331 (0.0331)	-0.0240 (0.0379)	-0.0098 (0.0376)	-0.0855 (0.0933)	-0.228 (0.0798)	0.0104 (0.138)	-0.0352 (0.137)	-0.163** (0.104)	0.0408 (0.149)
Public employee	0.0150 (0.0109)	-0.0179* (0.0100)	0.0289** (0.0129)	0.0705* (0.0354)	-0.00916 (0.0357)	0.114** (0.0480)	0.0118 (0.0567)	-0.0406 (0.0467)	0.0316 (0.0790)
Private employee	-0.0152 (0.0123)	-0.0715*** (0.0165)	0.0112 (0.0128)	-0.0321 (0.0375)	-0.159** (0.0524)	0.0426 (0.0452)	-0.00164 (0.0472)	-0.0674 (0.0565)	0.0386 (0.0605)
Marital status									
Single	0.0175 (0.0162)	0.0091 (0.0229)	0.0429 (0.0535)	0.0511 (0.0616)	0.0432 (0.0559)	0.0517 (0.0823)	0.102 (0.0713)	0.0908 (0.0897)	0.0962 (0.0871)
Living together	0.0073 (0.0165)	-0.0072 (0.0239)	0.0131 (0.0219)	0.0126 (0.0622)	-0.0341 (0.0782)	0.0342 (0.0849)	0.0626 (0.0671)	-0.0456 (0.0928)	0.108 (0.0846)
Married	0.0169 (0.0139)	0.0132 (0.0623)	0.0177 (0.0177)	0.0489 (0.0507)	0.0490 (0.0666)	0.0502 (0.0667)	0.0820 (0.0509)	0.0456 (0.0808)	0.0929 (0.0615)
Divorced	-0.0166 (0.0182)	-0.0247 (0.0403)	-0.0146 (0.0185)	-0.0553 (0.0642)	-0.0445 (0.119)	-0.0586 (0.0746)	-0.0207 (0.0806)	-0.0282 (0.147)	-0.0221 (0.0911)
Separated	0.0036 (0.0235)	-0.0241 (0.0295)	0.0133 (0.0298)	0.0157 (0.0982)	-0.105 (0.0915)	0.0585 (0.128)	0.0779 (0.112)	-0.124 (0.104)	0.127 (0.138)
Demographic factors									
Age	0.0010*** (0.0003)	-0.0002 (0.0008)	0.0013*** (0.0004)	0.00262** (0.00117)	-0.000614 (0.00210)	0.00369** (0.00137)	0.00304** (0.00131)	-0.000607 (0.00218)	0.00378** (0.00154)
Gender	-0.0378*** (0.0072)	-0.0640*** (0.0135)	-0.0230*** (0.0061)	-0.128*** (0.0208)	-0.187*** (0.0404)	-0.0926*** (0.0214)	-0.117*** (0.0233)	-0.154*** (0.0424)	-0.0956*** (0.0256)
Use of a computer	0.021*** (0.0061)	0.0203 (0.0134)	0.0217*** (0.0067)	0.0468** (0.0222)	0.0231 (0.0396)	0.0548** (0.0256)	0.0220 (0.0288)	-0.00983 (0.0547)	0.0313 (0.0335)
Education	0.0014 (0.0015)	0.0027 (0.0024)	0.0028* (0.0017)	0.00436** (0.00476)	0.00322 (0.00353)	0.00396 (0.00532)	0.00973 (0.00573)	-0.0145 (0.0118)	0.0116 (0.00895)
Economic situation									
Financial satisfaction	0.0026 (0.0016)	0.0032 (0.0102)	0.0020 (0.0036)	0.00367 (0.00537)	0.00563 (0.00986)	0.00274 (0.00588)	-0.0257*** (0.0118)	-0.0275*** (0.0140)	-0.0263* (0.0138)
Upper class	-0.0049 (0.0182)	-0.0655 (0.0415)	0.0122 (0.0192)	-0.0889 (0.0731)	-0.310** (0.138)	-0.0221 (0.0836)	-0.245*** (0.0941)	-0.493*** (0.179)	-0.177 (0.108)
Upper middle class	-0.0004 (0.0078)	-0.0132 (0.0135)	0.0074 (0.0093)	-0.00186 (0.0262)	-0.0239 (0.0323)	0.0128 (0.0362)	-0.0447 (0.0403)	-0.0880* (0.0468)	-0.0198 (0.0513)
Lower class	0.0127 (0.0106)	0.0410** (0.0189)	0.0124 (0.0122)	0.00394 (0.0335)	0.0758 (0.0752)	-0.00411 (0.0387)	0.0638 (0.0511)	0.219* (0.127)	0.0484 (0.0560)
Working class	0.0208*** (0.0077)	0.0060 (0.0134)	0.0271*** (0.0092)	0.0469* (0.0235)	0.00489 (0.0269)	0.0641** (0.0302)	0.0760** (0.0315)	0.0901 (0.0591)	0.0744** (0.0355)
Opportunistic behaviors									
Stealing property never justifiable	0.1118*** (0.0081)	0.1390*** (0.0147)	0.1041*** (0.0078)	0.546*** (0.0269)	0.644*** (0.0492)	0.518*** (0.0268)	0.550*** (0.0275)	0.655*** (0.0572)	0.524*** (0.0259)
Claiming government benefits to which you to which you are not entitled	0.0430*** (0.0040)	0.0421*** (0.0041)	0.0429*** (0.0051)	0.150*** (0.0136)	0.128*** (0.0136)	0.156*** (0.0225)	0.154*** (0.0040)	0.130*** (0.0167)	0.158*** (0.0244)
Observations	40,133	12,265	27,868	40,133	12,265	27,868	34,812	9,428	25,384
R-squared				0.388	0.386	0.386	0.262	0.262	0.260
F-stat of excl. IVs							93.93	21.848	67.70
Hansen J statistic							(0.73)	(0.704)	(0.577)

Notes. Columns (1) to (3) report the findings using the weighted ordered probit; columns (4) to (6) the findings using the OLS methodology and columns (7) to (9) present the findings of the 2SLS estimations using the slave origins and the voting behaviours as instruments. Columns (1), (4), and (7) report estimates on the total sample. Columns (2), (6) and (8) the ones on advanced countries. Columns (3), (6) and (9) present estimates on non-advanced countries. All estimates include country fixed effects. The coefficients reported are the marginal effects for all the regressions. All regressions include country fixed effects. Robust standard errors clustered at the country level in parenthesis. * Significance at $p < 0.1$; ** idem at $p < 0.05$; *** idem at $p < 0.01$.

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3.3 Econometric issues: Causality

Although the previous findings are consistent with the predictions of the theoretical model, I cannot exclude potential endogeneity issues between tax morale and trust in public institutions, especially inverse causality and error measurement issues. Tax morale and trust in public institutions might be entangled making it difficult to identify the causal effects of trust in public institutions on tax morale. This section addresses potential endogeneity issues using the instrumental variables (IV) methods with two instruments that seem to satisfy both validity and relevance conditions. The identification strategy relies on the pioneering work of Murdock (1959)'s who mapped the spatial distribution of ethnic groups and the number of slaves exported during the transatlantic and the Indian Ocean slave trade.

I first match the slavery data to the corresponding ethnic group's information in the WVS. I then generate a dummy variable that takes one if a positive number of slaves has been exported in the corresponding ethnic group and 0 otherwise. For main slaves receiving countries such as the United-States, the dummy variable takes 1 for respondents reporting *Black or African origins* as an ethnic group. I argue as Nunn and Wantchecon (2011) that the trade of slaves caused a culture of mistrust, which may persist to this day and alter the trust in public institutions. This argument is in line with the literature focusing on the long-term legacy of slavery in Africa and the receiving countries.[17] The trust shocks caused by slavery, an event lasting for more than 400 years, may remain persistent and affect the actual level of trust in public institutions (Nunn and Wantchecon, 2011). The slaves were captured through state-organized raids and warfare, and a ubiquitous environment of insecurity caused individuals to turn on other (Piot, 1996), resulting in a general environment of mistrust in institutions. The historic nature of the data on slavery provides a solid basis of the exogeneity of the instrument as there is no apparent reason for which the slavery origin of the ethnic group could affect the actual tax morale directly, except through the trust channel.

I use as an additional instrument the taxpayer's voting behavior during the national

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[17]See for instance Nunn and Wantchecon (2011), Engerman and Sokoloff (2008), Nunn (2008a), and Nunn (2008b), and Mitchener and McLean (2003).

election. I hypothesize that taxpayers that always vote during national elections are more likely to trust public institutions or the ability of their vote to improve the quality of the institutions. As previously, this instrument seems to satisfy exclusion restriction condition. Outside trust in public institutions, there is no apparent reason for which voting during a national election can affect tax morale.

Following the literature[18], we use a two-stage least squares (2SLS) procedure in the identification strategy. The robustness checks section will discuss the findings using alternative methodology. The results reported in the columns (7) to (9) of table 1 confirm that trust in public institutions increases tax morale. As previously, there is no evidence of heterogeneous effects according to the level of development, while the magnitude of the effects remains higher in advanced countries relative to the emerging and developing ones. The differences suggest that in countries with better institutions, the taxpayers may attribute great importance to the institutions and, are therefore highly sensitive to the signal sent by the latter. The implicit contract between taxpayers and public institutions in such environment may have more value in advanced countries compared to emerging and developing countries where the quality of institutions is low.

On the opposite, the magnitude of the effects of the social norms on tax morale is slightly higher in non-advanced countries relative to the one in advanced countries. A finding that suggests that in emerging and developing countries, social norms may play an important role in taxpayers willingness to comply. The findings on the other explanatory variables are substantially the same.

Table 1 reports also the statistics from the weak and over-identification tests. As is can be seen, the weak identification test confirms the pertinence of the identification strategy. The null hypothesis of weak identification is rejected with an F-statistics between 21.85 and 93.93. Similarly, the over-identification restriction test fails to reject the null hypothesis that the instruments are valid. The first stage estimations reported in table 5 in the appendix A confirm the assumption of a negative relationship between having a slave origins and

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[18]See for instance Frey and Torgler (2007), Torgler and Schneider (2007).

trust in public institutions. The expected positive relationship between always voting in elections at the national level and trust in public institutions is also validated by the first stage estimations.

4 Sensitivity Analysis

In this section, we examine whether the results are robust to change in the estimation method, set of controls, and a sub-categorization of the index of trust in public institutions.

4.1 Alternative estimation method

The first set of robustness checks consists of using the 2-stages conditional maximum likelihood (2SCML) procedure to test and control for potential endogeneity issues due to reverse causality effects of trust in public institutions on tax morale. Since the dependent variable is a ranking information, a non-linear model is more appropriate. I check therefore the robustness of previous results by using 2SCML as an alternative identification strategy. This procedure was developed by Alvarez (1994) and Rivers and Vuong (1988) and consists of using, in the first step, the ordinary least squares regression to estimate the reduced form equations for endogenous variables and, in the second step, to include the residuals from the OLS regressions as additional variables in the weighted ordered probit estimation. According to Alvarez (1994), the 2SCML procedure is more efficient than the standard 2-stage probit procedure. The intuition behind the 2SCML is similar to a 2SLS estimation in the sense that the reduced forms equations contain variables that are excluded from the structural equation of interest. As described by Scholz and Lubell (1998), the residuals included in the final steps of the procedure are estimates of the portion of the variance of the endogenous variables accounted for within the system of equations.

The results reported in Table 2 show that the probability of stating that tax evasion is never justifiable increases by between 0.357 and 0.410 percentage points for a unit increases in trust in public institutions by one unit. Similarly, a one unit improvement in the social

norms on tax morale raises the taxpayer's willingness to comply by between 0.12 and 0.135 percentage points. As previously, the magnitude of the effects on trust in public institutions is higher in advanced countries relative to the one in emerging and developing countries. These findings corroborate those obtained previously and confirm that trust in public institutions increases tax morale.

Table 2: Robustness - Two Step Conditional Maximum Likelihood

Dependent variable: Tax morale	All sample (1)	Advanced countries (2)	Non-advanced countries (3)
Confidence in public institutions	0.357***	0.410***	0.361***
	(0.08)	(0.147)	(0.099)
Social norms on tax morale	0.129***	0.12***	0.135***
	(0.016)	(0.03)	(0.016)
Confidence in public institutions residual	-0.329***	- 0.366***	-0.336***
	(0.082)	(0.15)	(0.098)
Observations	34,812	9,428	25,384

Notes. The table reports estimates using the two-step conditional maximum likelihood. Columns (1) presents the coefficients on the total sample, columns (2) those in advanced countries and columns (3) estimates on emerging and developing countries. All estimates include all the control variables described previously as well as country fixed effects. The coefficients reported are the marginal effects. Robust standard errors clustered at the country level in parenthesis. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

4.2   Decomposition of trust in public institutions

The second sensitivity analysis involves creating various subcomponents of trust in public institutions and check whether the findings remain robust. In the baseline estimations, trust in public institutions is a combination of trust in courts, police, parliament, the civil service, universities and the government. To ensure that the results are not affected by this combination, we divide trust in public institutions into three subcomponents: trust in the system of law (police and courts), legislative and executive power (parliament and government) and other public services (universities and civil service). I expect tax morale to be affected by different components of trust in public institutions. Table 3 reports the findings using different subcomponents of trust in public institutions. Columns (1) to (3)

report the findings using the system of law, columns (4) to (6) the results on the legislative and executive power. Finally, columns (7) to (9) reports the findings on trust on universities and civil services. As it can be seen, all the sub-components of trust in public institutions increase taxpayers willingness to comply. As previously, the findings on advanced and non-advanced countries are slightly different on both trust in public institutions and the social norms on tax morale. The statistics from the weak and over-identification tests confirm that the identification strategy is valid and pertinent.

Table 3: Robustness - decomposition of confidence in public institutions variable

Dependent variable: Tax morale	All sample			Advanced countries			Non-advanced countries		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Law	1.223***			1.171**			1.292**		
	(0.394)			(0.459)			(0.529)		
Power		1.153***			1.184**			1.060***	
		(0.357)			(0.570)			(0.407)	
Other			1.318***			1.606***			1.281***
			(0.396)			(0.522)			(0.485)
Social norms	0.455***	0.469***	0.484***	0.498***	0.493***	0.424***	0.463***	0.482***	0.498***
on tax morale	(0.0551)	(0.0493)	(0.0584)	(0.0748)	(0.108)	(0.0699)	(0.0584)	(0.0492)	(0.0599)
Observations	36,000	35,717	35,865	9,794	9,723	9,662	26,206	25,994	26,203
R-squared	0.190	0.227	0.145	0.248	0.233	0.077	0.152	0.247	0.147
F-stat of excl. IVs	67.43	75.98	53.86	24.52	15.09	12.53	42.26	62.08	39.44
Hansen J statistic	2.51	0.02	0.08	0.877	4.36	0.18	1.68	0.743	0.335
	(0.113)	(0.886)	(0.781)	(0.349)	(0.04)	(0.670)	(0.195)	(0.389)	(0.563)

Notes. All estimates include all the control variables described previous as well as country fixed effects.
Robust standard errors clustered at the country level in parenthesis. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

4.3 Set of controls

Finally, I check whether the findings hold using additional control variables. First, I take into account taxpayer's political position as the latter could affect the tax morale and the taxpayer's trust in public institutions simultaneously. I include therefore political position as an additional control variable to check the robustness of the findings. The results reported in the panel A of table 4 show that trust in public institutions still increases tax morale, with heterogeneous effects as in the previous findings. Both weak and over-identification tests confirm the validity and the pertinence of the identification strategy. The null hypothesis of weak identification is rejected, while the over-identification restriction test fails to reject the null hypothesis that the instruments are valid.

Afterward, I check whether the results are sensitive to the inclusion of both trust in public institutions and trust in co-citizens.[19] The strategy here consists in including trust in co-citizens as an additional control variable. To minimize potential endogeneity issues between tax morale and trust in co-citizens, I use the average trust in co-citizen at the community level. The results reported in the panel B of table 4 corroborate those obtained so far. Trust in public institutions increases tax morale with a heterogeneous effect according to the level of development. The coefficient is statistically significant at the 1 percent level in each case. On the opposite, the average trust in others is not statistically significant in none of the regressions.

Finally, I check the robustness of the findings by controlling for the Roman culture. Recent literature highlights norms and culture as important determinants of tax morale (Besley et al., 2015; Alm and Torgler, 2006). Especially, Alm and Torgler (2006) report that countries having a Roman culture have a higher tax immorality relative to the other countries. The strategy consists here of including a dummy variable that takes 1 if the country has a Roman culture and 0 otherwise. A country is considered to a Roman culture if the latter has a latin language[20] as the official language and/or if the country was colonized by a country having

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[19]Scholz and Lubell (1998) discussed the interest to take account both aspects of trust.
[20]Latin languages refer to French, Italian, Spanish, Portuguese or Romanian.

a Roman culture. Although country fixed effects are supposed to capture norms and culture at the country level, the Roman culture variable may allow to better isolate the impact of trust in public institutions on tax morale. The findings reported in table 4 highlight that trust in public institutions still increases tax morale, with heterogeneous effects according to the level of development. These findings also corroborate the one from Alm and Torgler (2006) according to which countries having a Roman culture have a higher tax immorality in emerging and developing countries. In advanced countries, having a Roman culture tends to be positively associated with tax morale.

All the robustness checks corroborate the previous findings according to which that trust in public institutions increases tax morale. This effect is higher in advanced countries relative to the emerging and developing countries. These results also portray that social norms as one of the critical determinants for the taxpayers' willingness to comply.

Table 4: Table. Robustness - Additional control variables

Dependent variable: Tax morale	(1) All sample	(2) Advanced countries	(3) Developing countries
	Panel A. Political position		
Trust in public institutions	1.467***	2.119***	1.366**
	(0.491)	(0.764)	(0.589)
Social norms on tax morale	0.435***	0.412***	0.435***
	(0.0485)	(0.139)	(0.0504)
Political position	-0.0377**	-0.0328	-0.0359
	(0.0181)	(0.0268)	(0.0232)
Observations	28,855	7,320	21,535
R-squared	0.196	0.158	0.228
F-stat of excl. IVs	55.188	9.71	39.54
Hansen J statistic	0.220	0.176	0.508
	(0.639)	(0.675)	(0.476)
	Panel B. Average trust in the community		
Trust in public institutions	1.160***	1.296***	1.169***
	(0.336)	(0.459)	(0.415)
Social norms on tax morale	0.463***	0.455***	0.475***
	(0.0500)	(0.102)	(0.0517)
Average trust in other	0.0283	0.155	-0.00435
	(0.170)	(0.361)	(0.199)
Observations	34,140	9,322	24,818
R-squared	0.275	0.281	0.263
F-stat of excl. IVs	96.88	21.99	70.28
Hansen J statistic	0.03	0.126	0.171
	(0.855)	(0.722)	(0.679)
	Panel C. Romanic Culture		
Trust in public institutions	1.221***	1.328***	1.182***
	(0.362)	(0.380)	(0.444)
Social norms on tax morale	0.460***	0.498***	0.472***
	(0.0516)	(0.116)	(0.0529)
Romanic origins	-0.782***	0.143**	-0.743***
	(0.226)	(0.0663)	(0.265)
Observations	34,812	12,179	25,384
R-squared	0.261	0.257	0.259
F-stat of excl. IVs	93.93	63.43	67.70
Hansen J statistic	0.118	0.144	0.311
	(0.731)	(0.704)	(0.577)

Columns (1) presents the coefficients on the total sample, columns (2) those on advanced countries and columns (3) estimates on emerging and developing countries. All estimates include all the control variables described previous as well as country fixed effects. Robust standard errors clustered at the country level in parenthesis. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

5   Conclusion

Deciding to adhere to their tax obligations is a complex decision for taxpayers, and several factors motivate it. A large body of the literature on tax morale focused on horizontal relationships such as social norms and culture, temporary shocks, conditional cooperation, and religiosity to explain taxpayers' intrinsic motivation to pay their taxes. However, there is little evidence on the impact of the relationship between taxpayers and state (vertical relationship). This paper considers the relationship between taxpayers and public institutions as an implicit contract, which involves a rewards system, punishments, loyalty and mutual expectation. The paper supports that the proper functioning of this implicit contract depends on the taxpayer's trust in public institutions, which is affected by actions and signal from public institutions.

The paper first integrates a private institutional utility function in the standard model of tax evasion with testable predictions consistent with the empirical findings. The paper afterward uses the sixth wave of WVS (2010-2014) to examine the impact of trust in public institutions on tax morale. The findings highlight that trust in public institutions increases the willingness for taxpayers to comply. Heterogeneous effects analysis suggests that the impact of trust in public institutions on tax morale is higher in advanced countries relative to emerging and developing countries. These findings can be explained by the difference in the quality of institutions. In an environment with a good quality of institutions, taxpayers may be more sensitive to the signal sent by the public institutions relative to an environment where the quality of institutions is low. On the opposite, the paper provides the evidence that impact of social norms on tax morale is slightly higher in emerging and developing countries relative to advanced countries.

This paper devotes efforts to address potential endogeneity issues between tax morale and trust in public institutions. The identification strategy relies on the historical data on slavery at the tribe level and the taxpayers voting behaviors during national elections. The argument behind using the information on slavery is that the slave trade caused a culture of

mistrust, which may persist to this day and alter taxpayers trust in public institutions.

In addition, to shed light on the impact of trust in public institutions on tax morale, the paper provides a theoretical justification to the literature on the relationship between participative democracy, fiscal autonomy, decentralization and tax morale. Our findings suggest that participative democracy, fiscal autonomy, and decentralization may strengthen taxpayers' trust in public institutions as these policies and systems facilitate monitoring of public institutions and integrate the taxpayer in the decision-making process.

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Appendix A   First step estimations

Table 5: First Step Equation - Trust in Public Institutions

	All sample	Advanced countries	Non-advanced countries
	(1)	(2)	(3)
Slave origins	-0.0597**	0.00400	-0.0839***
	(0.0270)	(0.0869)	(0.00880)
Voting behavior	0.104***	0.0878***	0.105***
during national elections	(0.0194)	(0.0240)	(0.0239)
Observations	34,925	9,451	25,474
R-squared	0.222	0.209	0.216

Notes : Dependent variable is Confidence in public institutions. Columns (1) is the estimation results on the total sample, columns (2) results on advanced countries and columns (3) are estimations on less advanced countries. All estimates include country fixed effects.* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Appendix B   Descriptives statistics and countries

Table 6: Descriptive Statistics

	Advanced Countries	Non Advanced Countries	Minimum	Maximum
Tax morale	9.12	8.76	1	10
	(1.71)	(2.09)		
Confidence in institutions	2.52	2.42	1	4
	(0.60)	(0.77)		
Full time employee	0.41	0.31	0	1
	(0.49)	(0.46)		
Part time employee	0.10	0.09	0	1
	(0.30)	(0.29)		
Self employed	0.06	0.14	0	1
	(0.24)	(0.34)		
Unemployed	0.06	0.09	0	1
	(0.23)	(0.28)		
Retired	0.19	0.10	0	1
	(0.39)	(0.30)		
Student	0.06	0.08	0	1
	(0.24)	(0.27)		
Home	0.10	0.18	0	1
	(0.30)	(0.38)		
Employment public	0.26	0.37	0	1
	(0.44)	(0.48)		
Employment private	0.65	0.56	0	1
	(0.48)	(0.50)		
Age	48.20	39.85	16.00	99
	(17.60)	(15.73)		
Observations	20880	51119		

Table 7: Descriptive Statistics - suite

	Advanced Countries	Non Advanced Countries	Minimum	Maximum
Religious	0.47	0.75	0	1
	(0.50)	(0.43)		
Trust in other	0.40	0.19	0	1
	(0.49)	(0.39)		
Financial satisfaction	6.28	5.81	1	10
	(2.25)	(2.53)		
Single	0.22	0.26	0	1
	(0.42)	(0.44)		
Living together	0.08	0.05	0	1
	(0.27)	(0.23)		
Married	0.56	0.57	0	1
	(0.50)	(0.49)		
Divorced	0.06	0.03	0	1
	(0.23)	(0.18)		
Separated	0.02	0.02	0	1
	(0.13)	(0.13)		
Gender	0.47	0.48	0	1
	(0.50)	(0.50)		
Education	6.43	5.49	1	9
	(2.19)	(2.43)		
Upper class	0.01	0.02	0	1
	(0.11)	(0.15)		
Upper middle class	0.25	0.20	0	1
	(0.44)	(0.40)		
Lower class	0.05	0.14	0	1
	(0.22)	(0.34)		
Working class	0.28	0.29	0	1
	(0.45)	(0.45)		
Observations	20880	51119		

Table 8: List of countries

Countries	Observations	Countries	Observations
Algeria	1200	**New Zealand**	841
Armenia	1100	Nigeria	1759
Australia	1477	Pakistan	1200
Azerbaijan	1002	Palestin	1000
Belarus	1535	Peru	1210
Colombia	1512	Philippines	1200
Cyprus	1000	Poland	966
Chile	1000	Qatar	1060
China	2300	Roumania	1503
Ecuador	1202	Russia	2500
Egypt	1523	Rwanda	1527
Estonia	1533	**Singapor**	1972
Germany	2046	**Singapor**	1972
Ghana	1552	**South Korea**	1200
Iraq	1200	**Spain**	1189
Japan	2443	**Sweden**	1206
Jordan	1200	**Taiwan**	1238
Kazakhstan	1500	Trnidad and Tobago	999
Kuwait	1303	Tunisia	1205
Kyrgyzstan	1500	Turkey	1605
Lebanon	1200	Ukraine	1500
Libya	2131	**United States of America**	2232
Malaysia	1300	Uruguay	1000
Mexico	2000	Uzbekistan	1500
Morocco	1200	Yemen	1000
Netherland	1902	Zimbabwe	1500

Notes. Advanced countries are in bold.

Appendix C   Variables description

Religious: *Independently of whether you attend religious services or not, would you say you are :*

- *A religious person*

- *Not a religious person*

- *An atheist*

Religious is a dummy variable that takes 1 if the respondent is a religious person and 0 otherwise.

Employment status: *Are you employed now or not? If yes, about how many hours a week? If more than one job: only for the main job.*
Yes, has paid employment:

- *Full time employee (30 hours a week or more)*

- *Part time employee (less than 30 hours a week)*

- *Self employed*

No, no paid employment:

- *Retired/pensioned*

- *Housewife not otherwise employed*

- *Student*

- *Unemployed*

- *Other*

Public/private employees: *Are you working for the government or public institution, for private business or industry, or for a private non-profit organization? If you do not work currently, characterize your major work in the past! Do you or did you work for:*

- *Government or public institution*

- *Private business or industry*

- *Private non-profit organization*

Age: *Can you tell me your year of birth, please?*
Gender: *Male/Female ? (Male=1, Female=0)*
Economic_class: *People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the :*

- *Upper class*

- *Upper middle class*

- *Lower middle class*

- *Working class*

- *Lower class*

Education: *What is the highest educational level that you have attained?*

- *No formal education*

- *Incomplete primary school*

- *Complete primary school*

- *Incomplete secondary school: technical/vocational type*

- *Complete secondary school: technical/vocational type*

- *Incomplete secondary: university preparatory type*

- *Complete secondary: university preparatory type*

- *Some university level education, without degree*

- *University-level education, with degree*

Marital Statut : *Are you currently:*

- *Married*

- *Living together as married*

- *Divorced*

- *Separated*

- *Widowed*

- *Single*

Life satisfaction: *How satisfied are you with the financial situation of your household? Please use this card again to help with your answer: 1 = completely dissatisfied to 10 = completely satisfied.*

Political position: *In political matters, people talk of "the left" and "the right." How would you place your views on this scale, generally speaking? (1 = Left to 10=Right)*

Trust other: *Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? (1 = Most people can be trusted; 2 = Need to be very careful)*

Use of a computer: *How often, if ever, do you use a personal computer?*

- *Never*

- *Occasionally*

- *Frequently*

Sense of belonging to the nation: *Would you tell me how strongly you agree or disagree with each of the following statement about how you see yourself?*

- *I see myself as part of the nation.*

Proud to be a citizen of the country: *How proud are you to be a citizen of the country?*

- *Very proud*

- *Quite proud*

- *Not very proud*

- *Not at all proud*

Opportunistic behaviors: *Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between.*

1. *Claiming government benefits to which you are not entitled*

2. *Stealing property*

Please use this card again to help with your answer in each case: 1 = never justified to 10 = always justified.