

Tax morale and education

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Abstract

While the determinants of tax morale have been widely studied in the literature, surprisingly, the fundamental influence of education on tax morale has not been investigated yet. Based on the insights from the psychological and political science literature about the role of education for the formation of social values, in this paper, we analyze two channels through which education shapes tax morale. We find that while the tax morale of individuals that are net receivers of welfare state benefits increases with their educational level, it decreases with the educational level for those who are net contributors. Furthermore, our results indicate that the higher educated, who has been shown to be better enabled to assess information on public affairs from media, exhibit higher levels of tax morale in countries with a better quality of services, a fairer tax system and more transparent institutions.

JEL classification: H26; H52; I25

Key words: Tax morale; Tax compliance; Education; Welfare state benefits; Trust in public institutions

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1 Introduction

After the financial crisis in 2008 and the following sovereign debt crisis many countries have experienced a substantial cut of their tax revenues and have been obliged to reduce the size of the public sector and the amount of welfare benefits. In this context reducing tax evasion and increasing the tax morale of citizens has become a major objective of public fiscal policy. In a report for the European Parliament, [Murphy \(2012\)](#) estimates that in 2009 the tax revenue loss due to tax evasion in the EU exceeded 860 billion Euro. This represents a quantity similar to total healthcare expenditure in the EU. Unsurprisingly, the fight against tax evasion has become a principle aim in the EU ([European Commission, 2016](#)).

The literature agrees that tax evasion is a complex phenomenon that, beyond the traditional cost-benefit analysis, is influenced by several other factors conforming what has been called tax morale and which comprises personal values, social norms and attitudes towards public institutions. While the relationship between an individual's tax morale and some of its determinants is already well understood (e.g., tax behaviour of the individual's reference groups, age, gender, religion), the fundamental influence of education on tax morale is still ignored. This is the more surprising as from the psychology and political sciences literature we know that education is an important factor in channelling individual behaviour regarding social values, political attitudes and the general assessment of public affairs. Using these insights, in this article we explore the role of education as an indirect channel in shaping individuals' tax morale with data from the European Values Study ([EVS](#)).

From the results of the aforementioned literature there are two main reasons why the educational level should influence on tax morale. First, it is an indicator of higher cognitive abilities that are necessary for the understanding of the relationship between tax payments and many of the indirect benefits obtained individually in modern welfare states. Therefore, we expect that individuals that are the main beneficiaries of welfare state benefits exhibit higher tax morale and that this effect is more pronounced for the higher educated because they are more aware of the connection between tax payments and the benefits received from the state. Indeed, our result indicate that for unemployed and retired individuals tax morale and the educational level are positively related. By contrast, for the self-employed, that obtain comparatively lower benefits in exchange for their tax payments, tax morale and the educational level are negatively related. The second reason for which we expect education to have an influence on tax morale is that higher educated citizens are better informed and enabled to process information from the media. This affects their relationship with public institutions and, consequently, their tax morale. Our results confirm this conjecture. We find that the higher educated exhibit higher levels of tax morale in countries with better services, a fairer tax system and with more transparent institutions.

The remainder of this paper is organized as follows. Section 2 relates our study to the literature. In Section 3 we derive two hypotheses regarding the role of education on tax morale. Section 4 describes the data and the empirical model. In Section 5 we discuss the results of our empirical model and provide some robustness checks. Section 6 concludes.

2 Literature review

As tax compliance is an important topic and there exists a vast literature devoted to this matter, this section only gives a brief review of the literature mostly related to our study.¹ We distinguish between the economic literature based on the traditional tax evasion model and the multi-discipline literature on tax morale. Furthermore, we comment more specifically on the literature that has analysed the impact of education on tax compliance.

2.1 The traditional tax evasion model

The individual motives or incentives for tax evasion have been studied in the framework of the classical tax evasion model developed by [Allingham and Sandmo \(1972\)](#). This model analyses a tax payer's decision to evade taxes as an expected-utility maximization problem where effective tax evasion depends, on the one hand, on *tax enforcement* by the tax authority (the probability of detection and the severity of fines and sanctions for tax evaders), and on the other hand, on the *benefits from tax evasion* (evaded tax payments by under-declaration). However, as this model has failed to yield good predictions of the observed tax payers' behaviour in empirical studies or in laboratory experiments, the recent literature has focused on other factors to explain tax compliance. These are related to voluntary tax compliance and the concept of *tax morale* as opposed to enforced tax compliance on which the traditional tax evasion model relies.

2.2 Tax morale

The concept of tax morale is based on *voluntary tax compliance* and stems from the psychology and political science literature which have used the concepts of *personal and social norms* and *trust in authorities*, apart from *socio-demographic controls*, to explain tax compliance. Following the literature we categorize the associated studies into three branches: personal and social norms, trust in authorities and further socio-demographic controls.

Personal and social norms. The psychology literature has distinguished between personal and social norms ([Wenzel, 2004](#); [Hofmann et al., 2008](#)). Personal norms comprise personal values, ethic reasoning, inequality aversion and religious believes and deal with what is generally perceived as good or bad. For example, the religious convictions of individuals have been proved to be an important factor for voluntary tax compliance ([Grasmick et al., 1991](#); [Stack and Kposowa, 2006](#); [Torgler, 2006](#)). Social norms are socially shared beliefs about how members of a group should behave which according to [Sigala et al. \(1999\)](#) are one of the most important predictors of tax compliance. They find that a taxpayer's compliance crucially depends on the perceived tax evasion in her reference group (friends, neighbours, or colleagues). Finally, [Konrad and Qari \(2012\)](#) find that patriotic persons exhibit higher levels of tax morale.

Trust in public institutions. As another important factor for tax morale the literature has identified citizens' trust in public sector institutions where the perception of fairness and efficiency of the welfare state plays a prominent role. According to [Feld and Frey \(2002\)](#), the relationship between taxpayers and authorities can be understood as an implicit or 'psychological'

¹For more extensive literature reviews on tax evasion and tax morale see, for example, [Andreoni et al. \(1998\)](#), [Hofmann et al. \(2008\)](#), [Kirchler et al. \(2008\)](#), [Pickhardt and Prinz \(2014\)](#).

contract. Taxpayers expect that the government provides goods and services in exchange for their tax payments. As a result, tax compliance is higher (lower) in situations in which citizens are satisfied (discontent) with the *indirect benefits* they receive through the quality and quantity of public provision (e.g., [Alm and Jackson, 1993](#); [Barone and Mocetti, 2011](#)). Regarding the general quality of public provision it has been shown that ‘trust’ in political leadership and in the public administration leads to more voluntary tax compliance (e.g., [Torgler, 2004, 2005b](#); [Alm et al., 2006](#)).²

In this literature, the quality of public institutions and of service provision has been measured by the effectiveness of tax deterrence, the treatment of taxpayers by the tax authority, ethnic fractionalization, institutional transparency (corruption), or income inequality. Regarding the effectiveness of tax deterrence, a clear relationship between the intensity of control and the severity of sanctions, on the one hand, and tax compliance, on the other hand, cannot be established. Following [Feld and Frey \(2007\)](#), this ambiguous effects of tax deterrence can be explained by the fact that while more audits reduce tax evasion they can also create an atmosphere of mistrust that reduces tax compliance ([Pommerehne and Frey, 1992](#)). With respect to the treatment of taxpayers by tax authorities, [Frey and Feld \(2002\)](#) and [Feld and Frey \(2002\)](#) show for Switzerland that an increased dialogue between tax payers and tax authorities contributes to raise tax morale. This is particularly the case in cantons using referendums and initiatives in political decision making, whereas in cantons with a predilection for representative decision making a more authoritarian approach is found to be more effective.³ Ethnic fractionalization is shown to have a negative impact on tax compliance by [Lago-Peñas and Lago-Peñas \(2010\)](#). Moreover, [Torgler \(2006\)](#) finds that a higher level of perceived corruption (less institutional transparency) drops tax morale.⁴ Finally, [Doerrenberg and Peichl \(2013\)](#) find that individuals in countries with a more progressive tax rate system are more likely to exhibit a higher general tax morale where, however, this effect decreases with the individual income level.

Socio-demographic control variables. In addition to the two above mentioned groups of variables, most studies include a large number of socio-demographic variables as: age, gender, occupational status, marital status, income level, or educational level. Regarding the impact of these variables on tax morale it has been found that elder (e.g., [Torgler, 2005b](#); [Martinez-Vazquez and Torgler, 2009](#)), women (e.g., [Torgler and Murphy, 2004](#); [Alm and Torgler, 2006](#); [Torgler and Valev, 2010](#)), retired (e.g., [Torgler, 2005a, 2006](#); [Konrad and Qari, 2012](#)) and married individuals (e.g., [Torgler, 2005b](#); [Alm and Torgler, 2006](#)) exhibit higher levels of tax morale, while self-employed (e.g., [Torgler, 2004](#); [Alm and Torgler, 2006](#)) manifest lower levels of tax morale.

²Different measures of trust based on individual perceptions have been used in these studies (e.g., trust in government, trust in the president, trust in the legal system, trust in officials), showing a positive relationship with tax morale

³Regarding trust in tax authorities (i.e., the relationship between taxpayers and the tax office), [Kirchler et al. \(2008\)](#) suggest the ‘slippery slope’ framework for tax compliance in which both the power of tax authorities (tax enforcement) and trust in the tax authorities are relevant dimensions for understanding enforced and voluntary compliance.

⁴[Friedman et al. \(2000\)](#) show empirically in a cross-country study that corruption and the size of the shadow economy are positively correlated.

Finally, with respect to the effect of income on tax morale, the results are less clear.⁵ For example, [Torgler \(2006\)](#), [Alm et al. \(2006\)](#) and [Doerrenberg and Peichl \(2013\)](#) find a negative relationship between income and tax morale, while [Konrad and Qari \(2012\)](#) and [Torgler et al. \(2008\)](#) cannot find a significant impact of income on tax morale.

2.3 Education and tax compliance

Despite the large number of studies that analyse the determinants of tax compliance and tax morale none of them has comprehensively focused on the role of education in shaping tax morale. What is known about the influence of education on tax compliance stems from student questionnaires, country survey data or studies that include education as a further control. The limitations of these studies are that they have either been based on a limited number of student questionnaires or on surveys for specific countries. Furthermore, the studies that have included education merely as a further socio-economic control have obtained no unanimous result for its impact on tax morale.

Regarding the results obtained from studies based on student questionnaires, [Chan et al. \(2000\)](#) consider responses from 157 students from two universities, one in the U.S. and the other in Hong Kong. They observe a negative relationship between the educational level and tax compliance. [McGee and Ross \(2012\)](#) compare student surveys from six countries and obtain mixed results regarding the relationship between education and tax compliance. In Brazil, Russia and China the most opposed to tax evasion are the low educated, while in India and the U.S. the high educated exhibit higher tax morale. Instead, in Germany, it is the medium educated that exhibits lowest levels of tax compliance. Finally, [Ahmed and Braithwaite \(2005\)](#) based on a survey from 447 Australian graduates obtain that the way in which tertiary education is financed influences the posterior tax morale of the higher educated.

The influence of education on tax morale has also been analysed with country survey data. For the Netherlands, [Groot and van den Brink \(2010\)](#) examine a survey data set from 1996 on criminal behaviour to analyse the effects of education on offences and crimes committed. Among other results, they obtain that among the 2951 respondents of the survey the probability of committing tax fraud increases with years of education. The opposite result is obtained by [Alarcón-García et al. \(2012\)](#) who use Spanish data from a 2007 survey based on 1329 observations to analyse the relationship between gender and tax morale. They find that the level of education in general and the knowledge of fiscal norms in particular are important determinants of the individual's declared attitude towards fraud. In the case of education, they obtain that the individual attitude against fraud increases with the educational level.

Finally, education has been used as a socio-economic control in numerous studies to explain tax morale. Studies that identify a positive relationship between education and tax morale are, for example: [Torgler \(2005a\)](#) that analyses the relationship between direct democracy and tax morale for Switzerland; [Torgler \(2005b\)](#) that analyses the determinants of tax morale in Latin American countries; [Konrad and Qari \(2012\)](#) that explores the relationship between patriotism and tax morale; [Torgler et al. \(2008\)](#) that investigate the effect of tax morale on tax compliance

⁵Notice, that from the theoretical tax evasion models by [Allingham and Sandmo \(1972\)](#) and [Yitzhaki \(1974\)](#) the predicted influence of income on tax compliance is also ambiguous.

for the U.S. and Turkey; or [Torgler \(2012\)](#) that explores differences in tax morale for 10 eastern European countries. Examples of studies that find a negative relationship are: [Torgler \(2006\)](#) that analyses the role of religiosity on tax morale; [Frey and Torgler \(2007\)](#) that study the influence of the perception of other taxpayers' behaviour on an individual's tax morale; [Lago-Peñas and Lago-Peñas \(2010\)](#) that explore the determinants of tax morale in European countries; or [Doerrenberg and Peichl \(2013\)](#) that investigate the effect of tax progressivity on tax morale.

3 Hypotheses: Education and tax morale

From the previous literature review we observe that while the educational level has been included in different studies as an explanatory control variable, its fundamental influence on tax compliance behaviour has been completely ignored. This is the more surprising as we know from numerous studies in the fields of psychological and political sciences that the level of education is an important factor that channels individuals behaviour regarding social values, political attitudes and the general assessment of public affairs. There are two main reasons why the educational level should have a substantial influence on tax compliance behaviour. First, a higher educational level is an indicator of higher cognitive abilities [Arrow \(1973\)](#) which are essential for the understanding of the functioning of modern welfare states and the relationship between its general (indirect) benefits and individual tax compliance. For example, [Lewis \(1978, 1982\)](#) and [Niemirowski et al. \(2003\)](#) find that having obtained a certain educational level is a necessary condition to understand tax laws which is important to generate trust in authorities. Second, the information from media is a key factor when shaping citizens' valuation of government performance (e.g., [Keohane and Nye, 1998](#); [Newton and Norris, 2000](#); [Norris, 2000](#)) and education is paramount for processing this information. As formulated by [Sniderman et al. \(1993\)](#), "Citizens acquired through formal schooling not simply relevant information they required to reason about political choices, but more fundamentally the ability to manipulate information efficiently and to gather it effectively after they had left school". Thus, the knowledge gap theory proposed by [Tichenor et al. \(1970\)](#) states that a higher educational level leads to a greater acquisition of knowledge from news, which entails that higher educated citizens are better informed even when all citizens are exposed to exactly the same information. [Eveland and Scheufele \(2000\)](#) show that this knowledge gap between the low and high educated becomes even bigger among light media users. In the same vein, [Price and Zaller \(1993\)](#) argued that prior knowledge is a key factor for the assessment of new information. Furthermore, it has been shown that the attention to political mass media is higher for the higher educated (e.g., [McCombs and Shaw, 1972](#); [Freedman and Goldstein, 1999](#)) which are, generally, less inclined towards holding a passive exposition to mass media. For example, [Johnson and Kaye \(2003\)](#) using survey data gathered in the context of the US presidential elections in 1996 and 2000, find that the amount of time in seeking political information online is positively associated with the educational level. Finally, education also motivates the general interest in public affairs and civic engagement to the extent that the higher educated are more prone to be politically active ([Dalton, 2005](#)).

Summarizing both arguments, higher educated citizens are better enabled to understand the functioning of modern welfare states, and are more informed about the performance of governments and public administrations. Both aspects are essential for shaping individuals' tax compliance decision. The decision to voluntarily comply with tax obligations is a complex and multifaceted issue where in the assessment of the performance of the public sector individuals

have to consider both the personal (direct) benefits from public service delivery and general (indirect) benefits from a well-organized welfare state (general quality of public provision, effective deterrence, transparency of public institutions, income redistribution, ...). Therefore, the educational level should influence an individual's tax compliance behaviour as it affects both the quality of information about government and public sector performance, and the understanding of the relationship between individual compliance and the quality of general public services. In the following we formulate two hypotheses regarding the influence of the educational level on tax morale.

The first hypothesis regarding the influence of education on tax morale we formulate, considers the link between tax morale and individual *direct benefits* from tax compliance. According to the definition by [Feld and Frey \(2007\)](#), tax morale can be understood as the individual's intrinsic motivation to pay taxes which is the result of a 'psychological tax contract' between citizens and the state where citizens receive goods and services in exchange for their tax payments. However, the amount of goods and services that an individual receives from the state is not the same for all. Thus, individuals with children benefit from public education, the retired from public pensions, and the unemployed from public unemployment benefits. Therefore, tax morale should vary across individuals according to their personal situation. Moreover, from the above considerations we should expect that education is an important channel that makes citizens conscious of the link between tax payments and individual (direct) benefits from the tax system. Accordingly, the first hypothesis we formulate is:

Hypothesis 1: Larger *direct benefits* from the welfare state positively affect an individual's tax morale where the effect increases with the educational level.

The second hypothesis considers the more complex relationship between tax payments and the general benefits that citizens obtain from a well-organized welfare state. Examples of these *indirect benefits* are the general quality of public services, the fairness of the tax system or the transparency of public institutions. Again, education plays a crucial role in assessing these indirect benefits which ultimately affect an individual's intrinsic motivation to pay taxes. For example, as the assessment of public sector performance requires the attention to political mass media and the processing of the information received, higher educated citizens will be more enabled to make a less-biased valuation. Furthermore, as the evaluation of the *indirect* benefits from tax payments requires higher cognitive abilities and these are correlated with the educational level, we expect the latter also for this reason to be a key factor in shaping of tax morale. According to these considerations, the second hypothesis we formulate is:

Hypothesis 2: The educational level positively (negatively) affects tax morale when the *indirect benefits* from the welfare state are large (small).

Figure 1 displays the general structure of the determinants of tax compliance, as discussed in Section 2, and summarizes our hypotheses regarding the channels through which education shapes individual's tax morale.

Insert Figure 1 about here.

4 Empirical approach

4.1 Data

The micro-level data is from the 2008 wave of the [EVS](#) which is a commonly used database in the context of the tax morale literature.⁶ The [EVS](#) specially served our purpose, as it enables the study of a representative group of individuals for a large set of relatively homogeneous countries. Out of 47 European countries included in the survey 29 were finally included in the analysis, namely, Austria (AUT), Belgium (BEL), Bulgaria (BUL), Croatia (CRO), Cyprus (CYP), Czech Republic (CZE), Denmark (DEN), Estonia (EST), Finland (FIN), France (FRA), Germany (GER), Greece (GRE), Hungary (HUN), Ireland (IRL), Italy (ITA), Latvia (LAT), Lithuania (LIT), Luxembourg (LUX), Norway (NOR), Poland (POL), Portugal (POR), Romania (ROM), Slovakia (SVK), Slovenia (SVN), Spain (SPA), Sweden (SWE), Switzerland (SWI), Turkey (TUR) and United Kingdom (UK).⁷ Our macro-level data stems from different sources which can be consulted in [Table 1](#). [Table 2](#) and [Table 3](#) display the descriptive statistics for our dichotomous and continuous variables, and for our categorical variables, respectively.

Insert Table 1 about here.

4.1.1 Dependent variable: tax morale

Our dependent variable (*tax morale*) stems from the EVS and has been constructed on the basis of the responders' answers to the following question:

Please tell me for each of the following whether you think it can always be justified, never be justified, or something in between, using this card: 'Cheating on tax if you have the chance'

Respondents were asked to assess this issue in a ten-point scale, from 1 (never) to 10 (always). As it is common in the literature the answers were recoded into a four-point scale where we used the following criterion: responses 7 through 10 were combined into a value 0 (low tax morale), while the remaining responses were combined in groups of two (1 and 2 into 3; 3 and 4 into 2; and 5 and 6 into 1). However, to check the robustness of our results to the chosen categorization, in [Section 5.2](#) we also use the original ten-point scale.

The question of whether the responses to this question really provide unbiased data has been widely discussed in the literature. Following [Doerrenberg and Peichl \(2013\)](#) the general conclusions of this literature can be summarized in that such a bias exists ([Elffers et al., 1987](#)); that this bias, however, is lower if one asks about tax morale instead of tax compliance ([Frey and Torgler, 2007](#)); and that for developed countries tax morale (as obtained from the [EVS](#)) and actual tax compliance are highly correlated ([Richardson, 2006](#); [Torgler et al., 2008](#)). Consequently, we consider that this question allows us to obtain an appropriate measure of tax morale.

⁶We limit the analysis to the 2008 wave as some of our variables are only available for this year.

⁷The country selection criterion responds to data availability. Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kosovo, Macedonia, Moldova, Montenegro, the Netherlands, Northern Ireland, the Russian Federation, Serbia and Ukraine have not been included because of either lack of observations (in most of the cases) or missing data for some of our country-level variables (this is the case of the Netherlands and Malta).

Insert Table 2 and Table 3 about here.

4.1.2 Explanatory variables

Our main explanatory variables is *education* which is separated into three categories: low, medium and high.⁸ Low education indicates that an individual has completed (compulsory) elementary education or has it inadequately completed. Medium education indicates that an individual has some sort of secondary school education. Finally, high education captures those individuals with university studies (completed or uncompleted). The remaining variables are grouped into four classes: personal and social norms, direct benefits, indirect benefits and control variables.

Personal and social norms. As variables that indicate personal and social norms we consider whether an individual is *religious*, whether she is *patriotic*, and whether she is *inequality averse*. All these variables are defined as dummy variables where 1 indicates a positive attitude (religious, patriotic, inequality averse) and 0 a negative attitude (non-religious, non-patriotic, inequality non-averse). As it has been discussed in Section 2.2, we expect these variables to be positively related to tax morale.

Direct benefits. As mentioned before, an individual’s intrinsic motivation for voluntary tax compliance stems from a psychological tax contract between citizens and the state where citizens counterbalance their tax obligations with the goods received in exchange. As formulated in Hypothesis 1, we expect that an individual that directly benefits more from public goods provision experiences a higher morale obligation for tax compliance. To test this hypothesis, as direct benefits we consider the following variables: the *number of children*, *employed*, *unemployed*, *self-employed*, *retired*, and *other*. As public goods and transfers benefit individuals with children, unemployed individuals, and retired individuals more than proportionally, we expect both variables to have a positive relationship with tax morale. On the contrary, employed and self-employed individuals are expected to exhibit lower tax morale as they obtain comparatively lower benefits from the state in exchange for their tax payments.

Indirect benefits. To test Hypothesis 2, we consider the ‘indirect benefits’ that modern welfare states offer and that are expected to influence an individual’s tax morale. As indicators of these indirect benefits we consider: the *public social expenditure*, *ethnic fractionalization*, *transparency*, *income inequality*, *relative redistribution*, and *deterrence*. *Public social expenditure* is measured as the share of the sum of public health, education and social benefits expenditure in GDP.⁹ *Ethnic fractionalization* (from Alesina et al., 2003) is used as an indicator of the match of public goods provided by the state and the preferences for public goods of citizens (Alesina et al., 1997). Thus, a higher fractionalization indicates a larger mismatch which should lower tax morale. *Transparency* measures “the perceived levels of public-sector corruption in a given country on a scale from zero (highly corrupt) to ten (highly clean)” (Transparency

⁸The details on the measurement and definition of the variables and the sources from which the data has been retrieved are in Table 1.

⁹Missing 2008 values on public education expenditure for Greece, Luxembourg, Romania, and Turkey are imputed with data from 2005, 2007, 2007 and 2006, respectively. The missing 2008 value on public health expenditure for Croatia is imputed with the 2012 value.

International, 2008). *Income inequality* is measured as the pre-tax Gini index of inequality in equivalized household market income which has been found, as mentioned before, negatively related to tax morale in some studies. *Relative redistribution* is the percentage reduction in market-income inequality due to taxes and transfers and, therefore, indicates the effectiveness of the public sector in reducing income inequality. Finally, *Deterrence* measures the effort and effectiveness of tax authorities in fighting tax evasion. According to Hypothesis 2 we expect that the higher educated, which are supposed to be better informed about government performance, exhibit higher tax morale as a response to positive performance (more social expenditure, low income inequality, high relative redistribution, low fractionalization, high transparency, effective deterrence) and vice versa.

Controls. Finally, as further control variables we include the commonly used variables in the literature: *Income*, *Age*, *Gender*, *Marital status*, and *Natural-born citizen*. The expected impact of these variables on tax morale has already been extensively commented in Section 2.

4.2 Empirical model

As is common in the literature, we use an ordered probit model to account for the ranking information of our four-point scale dependent variable (tax morale). Due to the non-linear form of the ordered probit estimation the size of the coefficients should not be directly interpreted, but the focus should be on the sign and the significance of the estimates. In all specifications the model includes individual and country level variables (with Germany as the reference country). Clustered standard errors by country are reported to avoid an underestimation of standard errors because of intra-group error correlation. Accordingly, our estimation model is:

$$y_{i,c}^* = \beta' x_{i,c} + \varepsilon_{i,c} \quad (4.1)$$

where y^* is a latent variable (tax morale of individual i in country c), and x is a vector of explanatory variables. The latent variable $y_{i,c}^*$ is only observable when it crosses thresholds:

$$y_{i,c}^* = j \quad \text{if} \quad \alpha_j < y_{i,c}^* \leq \alpha_{j+1}, \quad j = 0, 1, 2, 3,$$

and the probability that $y_{i,c}^* = j$ is:

$$P(y_{i,c}^* = j) = F(\alpha_{j+1} - \beta' x_{i,c}) - F(\alpha_j - \beta' x_{i,c})$$

where F denotes the standard normal cumulative distribution function. The four categories for our tax morale variable y^* are: low ($j = 0$), medium low ($j = 1$), medium high ($j = 2$), and high ($j = 3$).

To test our first hypothesis, we include interactions between educational levels and the *direct benefits* variables. Country dummies are used to account for unobserved country effects. More specifically, our first hypothesis is estimated with the following model (Models I and II):

$$\beta' x_{i,c} = Edu_{i,c} + PS_{i,c} + DB_{i,c} + DB_{i,c} \times Edu_{i,c} + CL_{i,c} + \nu_c + \eta_j + \varepsilon_{i,c} \quad (4.2)$$

where Edu indicates educational level dummies (medium, high) with their corresponding coefficients; PS a vector of personal and social norms dummies (Religious, Patriotic, Inequality averse) with their corresponding coefficients; DB a vector of direct benefits dummies (Number

of children, Unemployed, Self-employed, Retired, Other) with their corresponding coefficients; CL a vector of control variables (two income dummies (medium, high), Age, Gender, Married, Widowed, Divorced, Natural-born citizen); ν_c a vector of country dummies; and η_j a vector of three intercepts for each tax morale category (middle low, middle high, high as compared to low as the base category). The individual-level variables used in our empirical models can be considered as uncorrelated. Notice, that this is also case for education and income whose correlation coefficient is 0.30.¹⁰

To test the second hypothesis of whether the educational level acts as an indirect channel in shaping tax morale when individuals assess the indirect benefits of the welfare state, we substitute the country-fixed effects in equation 4.2 by different country-level variables which we interact with the educational level. That is, we estimate the following models (Models III-VIII):

$$\beta' \mathbf{x}_{i,c} = Edu_{i,c} + PS_{i,c} + DB_{i,c} + DB_{i,c} \times Edu_{i,c} + CL_{i,c} + IB_{i,c} + IB_{i,c} \times Edu_{i,c} + \eta_j + \varepsilon_{i,c} \quad (4.3)$$

where IB are the indirect benefit variables (Public social expenditure (Model III), Ethnic fractionalization (Model IV), Transparency (Model V), Income inequality (Model VI), Relative redistribution (Model VII), and Deterrence (Model VIII)). The reason to include these country-specific variables in alternative model specifications is that some them are highly correlated between them.

5 Results

5.1 Regression results

The estimation results are displayed in Table 4. As the interpretation of the estimated coefficients in the ordered probit estimation model is not straight forward, in the discussion of the results we concentrate on the significance and the sign of the estimated coefficients. Specification I and II contain country fixed effects while specifications III-VIII include different country contextual-level variables that allow us to test Hypothesis 2. By contrast, as cross-country differences are best accounted for in specifications I and II we consider these as most suitable to test hypothesis I which is related to the individual characteristics of the respondents.

Specifications I and II differ with respect to the inclusion of education interaction terms with the variable *Number of children*. As can be seen from Table 4, in specification I these interactions turn out to be non-significant. However, in specification II without these interactions, the *number of children* has a significant positive impact on tax morale. The direct (non-interacted) effect of *education* on tax morale turns out to be non-linear. Thus, while individuals with a medium level of education exhibit lower levels of tax morale, there is no significant differences between the low and the high educated. With respect to the influence of personal and social norms, our results are in line with what has been found in the literature. *Religious*, *Patriotic*

¹⁰As can be expected this is not the case for the correlation coefficients of some of control variables *Age* with *Retired* (0.70), or *Age* with *Widowed* (0.43). The exclusion of one of these variables, however, does not change our results qualitatively. More details on correlations can be found in the correlation matrix which is in the supplementary material to this article.

and *Inequality averse* individuals are more likely to manifest higher tax morale.

Insert Table 4 about here.

Our first hypothesis is checked with the interaction of educational levels with the variables indicating the direct benefits from tax compliance. As mentioned before, with regard to the *number of children* education shows no distinguishable influence on tax morale. On the contrary, for *Unemployed*, *Self-employed*, and *Retired* the educational level is an important channel to assess the individual status in the context of the psychological tax contract. Thus, unemployed with a medium or a high educational level are more likely to reveal higher tax morale than those with a low educational level. We take this as evidence for the fact that the higher educated are more conscious of the benefits they receive from general tax compliance. The same is true for retired individuals. In line with this argument, self-employed individuals which are those that generally obtain comparably less benefits from the state, exhibit lower tax morale when their educational level is medium or high. Considering these results together, we accept Hypothesis 1 that education plays an important role in shaping the tax morale of individuals according to their beneficiary status in the welfare state.

With respect to the controls used in models I and II, generally, the sign and significance of the estimates are in line with previous empirical studies which are summarized in Section 2. For the income level dummies, as Konrad and Qari (2012), we find no significant influence on tax morale.¹¹ Notice, that *Natural-born citizen*, which to our knowledge has not been used in previous studies as a determinant of tax morale, is negatively related to tax morale. According to the ‘psychological tax contract’, a reason for this can be that citizens that are nationalized by birth expect to receive more and better goods and services from the state in exchange for their tax payments than those citizens that immigrated.

As mentioned before, we use specifications III-VIII to test the validity of Hypothesis 2. We expect that the higher educated which are supposed to be better informed about general public sector performance related to the indirect benefits from the welfare state, enhance (lessen) tax compliance as a response to good (bad) performance. As a first measure of such a performance in specification III we use *Public social expenditure*. It turns out that effectively, higher public social expenditure increases the morale of the medium and high educated in comparison to the low educated. *Ethnic fractionalization*, as a measure of the mismatch between public goods received and desired by citizens, reduces tax morale according to the level of education. Our third measure, *Transparency*, has a slight positive effect on tax morale in the case of the high educated. For the impact of *Income inequality* on tax morale we find no significant differences between alternative educational levels. Our fifth measure of general public sector performance, *Relative redistribution*, indicates that tax morale raises with the educational level regarding the impact of this variable on tax compliance (which turn out to be negative). Finally, for the impact of *Deterrence* on tax morale we find no significant differences between alternative educational levels. Taken together, these results lead us to accept Hypothesis 2 that impact of the indirect benefits that citizens obtain from the welfare state on tax morale is affected by their educational level. Good performance (more social expenditure, higher transparency, better relative income

¹¹See also Section 5.2, where the relationship between income and tax morale is further discussed.

redistribution) increase the tax morale of the high educated more than that of the low educated, while bad performance (more fractionalization) decrease the tax morale of the high educated more than that of the low educated.

5.2 Robustness checks

To check the robustness of our results we perform three alternative estimations. Firstly, to test whether the results are sensitive to the categorization of our dependent variable tax morale, we estimate models I-VIII with the original ten-point scale from the questionnaire. The results are displayed in Table 5. As it turns out, the results do not change qualitatively.

Insert Table 5 about here.

Secondly, we use the generalized linear model (GLM) as an alternative estimation method. For this purpose, we rescale our dependent variable from the four-point scale to take values between 0 and 1. As can be seen from Table 6 this also does not imply any substantial changes in the results we have obtained before.

Insert Table 6 about here.

Finally, even if income and education are only weakly correlated, one might argue that some of the effect of education on tax morale described in Section 5 stem from income and not from education.¹² To analyse this question, we perform two additional robustness checks in which income level dummies replace our educational level dummies as interaction terms. In the first one, we replace all education interactions by income interaction, while in the second one, only education interactions with country-level variables are substituted. The results are displayed in Table 7 and Table 8, respectively. As can be observed, at the individual level, none of the interaction coefficients are significant. With respect to the interactions of income with the country-level variables, though some of the interaction coefficients are significant (*Ethnic fractionalization* with medium and high income, *Income inequality* with medium income, and *Relative redistribution* with medium income), we observe that the explanatory power of these models is below that of the corresponding models in Section 5. In conclusion, we take these results for evidence that the above mentioned impacts on the relationship between direct and indirect benefits on tax morale are mainly channelled through education and not income.

Insert Table 7 and Table 8 about here.

¹²The income level variable has been introduced as the harmonized household income level categorized into 3 intervals where the data is directly provided by the EVS. Alternatively, we have used the original twelve-point scale variable for two additional robustness checks in which *Income* has been measured either by dummy variables or as a continuous variable. The results obtained from these two robustness checks (not reported) do not differ from those obtained using the harmonized variable provided by the EVS.

6 Conclusions

This study analyses the role of education in shaping tax morale whose fundamental influence has been totally ignored by the existing literature. Based on the results from the psychological and political science literature, where it is well understood that education is an important factor in channelling individual behaviour regarding social values, and recognizing that an individual's intrinsic motivation to pay taxes is the result of a psychological tax contract, we derive two hypotheses. First, we expect that individuals that obtain higher direct benefits from the state exhibit higher tax morale and this effect is more pronounced for the more educated who are more conscience of the connection of between tax payments and received benefits from the state. Our results indicate that education, indeed, has an important impact on tax morale for those individuals that are beneficiaries of the welfare state (i.e., unemployed, retired, ...). Second, as more educated are better and more informed, we expect that the educational level positively (negatively) affects tax morale when the indirect benefits that citizens obtain from the welfare state are large (small). Our results confirm this hypothesis. We find that the higher educated exhibit higher levels of tax morale in countries with a better quality of services, a fairer tax system and more transparent institutions.

Some important policy implications can be derived from these findings. First, as some of the influence from education on tax morale is channelled through a better information about public affairs, it becomes particularly convenient to enhance the information about direct and indirect benefits of a tax financed welfare state, especially in the case of the less educated. Second, increasing the educational level of the population can be an instrument to increase tax morale and reduce tax evasion. However, this is only the case when individuals perceive that what they receive in exchange for their tax payments from the state is of high quality. Otherwise, increasing the educational level of the population can have just the contrary effect and reduce tax morale. Therefore, the impact on tax morale of the observed tendency of a steadily increasing mean educational level of the population in many European countries should be assessed in light of the cuts in social benefits after the financial crisis in 2008 in many of these countries. The next [EVS](#) wave might allow to assess how both tendencies have affected overall tax morale in European countries.

References

- Ahmed, E. and Braithwaite, V. (2005). A need for emotionally intelligent policy: Linking tax evasion with higher education funding. *Legal and Criminological Psychology*, 10:291–308.
- Alarcón-García, G., Beyaert, A., and de Pablos, L. (2012). Fiscal awareness : A study of the female attitude towards fraud in Spain. In M. Pickhardt & A. Prinz (Eds.), *Tax Evasion and the Shadow Economy* (pp. 61–86). Cheltenham, UK, Northampton, MA, USA: Edward Elgar.
- Alesina, A., Baqir, R., and Easterly, W. (1997). Public goods and ethnic divisions.
- Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., and Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth*, 8:155–194.
- Allingham, M. G. and Sandmo, A. (1972). Income tax evasion: A theoretical analysis. *Journal of Public Economics*, 1:323–338.
- Alm, J. and Jackson, B. R. (1993). Fiscal exchange, collective decision institutions, and tax compliance. *Journal of Economic Behavior and Organization*, 22:285–303.
- Alm, J., Martinez-Vazque, J., and Torgler, B. (2006). Russian attitudes toward paying taxes – before, during, and after the transition. *International Journal of Social Economics*, 33(12):832–857.
- Alm, J. and Torgler, B. (2006). Culture differences and tax morale in the United States and in Europe. *Journal of Economic Psychology*, 27(2):224–246.
- Andreoni, J., Erard, B., and Feinstein, J. (1998). Tax compliance. *Journal of Economic Literature*, 36(2):818–860.
- Arrow, K. J. (1973). Higher education as a filter. *Journal of Public Economics*, 2(3):193–216.
- Barone, G. and Mocetti, S. (2011). Tax morale and public spending inefficiency. *International Tax and Public Finance*, 18(6):724–749.
- Chan, C. W., Troutman, C. S., and O’Bryan, D. (2000). An expanded model of taxpayer compliance: Empirical evidence from the United States and Hong Kong. *Journal of International Accounting, Auditing and Taxation*, 9(2):83–103.
- Dalton, R. J. (2005). The social transformation of trust in government. *International Review of Sociology*, 15(1):133–154.
- Doerrenberg, P. and Peichl, A. (2013). Progressive taxation and tax morale. *Public Choice*, 155(3-4):293–316.
- Elffers, H., Weigel, R. H., and Hessing, D. J. (1987). The consequences of different strategies for measuring tax evasion behavior. *Journal of Economic Psychology*, 8(3):311–337.
- European Commission (2016). European Commission website (2016). Available at: http://ec.europa.eu/taxation_customs/fight-against-tax-fraud-tax-evasion/a-huge-problem_en. Retrieved in October, 2016.

- EUROSTAT (2016). Eurostat database. Available at: <http://ec.europa.eu/eurostat/data/database>. Retrieved in August, 2016.
- Eveland, W. P. and Scheufele, D. A. (2000). Connecting news media use with gaps in knowledge and participation. *Political Communication*, 17(3):215–237.
- EVS (2011). European Values Study 2008 (release 3, 2011), 4th wave, integrated dataset. GESIS data archive, Cologne, Germany, ZA4800 data file version 3.0.0 (2011-11-20). Available at: <http://zacat.gesis.org>. Retrieved in December, 2015.
- Feld, L. P. and Frey, B. S. (2002). Trust breeds trust: How taxpayers are treated. *Economics of governance*, 3(2):87–99.
- Feld, L. P. and Frey, B. S. (2007). Tax compliance as the result of a psychological tax contract: The role of incentives and responsive regulation. *Law and Policy*, 29(1):102–120.
- Freedman, P. and Goldstein, K. (1999). Measuring media exposure and the effects of negative campaign ads. *American Journal of Political Science*, 43(4):1189–1208.
- Frey, B. S. and Feld, L. P. (2002). Deterrence and morale in taxation: An empirical analysis.
- Frey, B. S. and Torgler, B. (2007). Tax morale and conditional cooperation. *Journal of Comparative Economics*, 35(1):136–159.
- Friedman, E., Johnson, S., Kaufmann, D., and Zoido-Lobaton, P. (2000). Dodging the grabbing hand: the determinants of unofficial activity in 69 countries. *Journal of Public Economics*, 76(3):459–493.
- Grasmick, H. G., Bursik, R. J., and Cochran, J. K. (1991). “Render unto Caesar what is Caesar’s”: Religiosity and taxpayers’ inclinations to cheat. *The Sociological Quarterly*, 32(2):251–266.
- Groot, W. and van den Brink, H. M. (2010). The effects of education on crime. *Applied Economics*, 42(3):279–289.
- Hofmann, E., Hoelzl, E., and Kirchler, E. (2008). Preconditions of voluntary tax compliance. *Zeitschrift für Psychologie / Journal of Psychology*, 216(4):209–217.
- Johnson, T. J. and Kaye, B. K. (2003). A boost or bust for democracy?: How the web influenced political attitudes and behaviors in the 1996 and 2000 presidential elections. *The International Journal of Press/Politics*, 8(3):9–34.
- Keohane, R. O. and Nye, J. J. S. (1998). Power and interdependence in the information age. *Foreign Affairs*, pages 81–94.
- Kirchler, E., Hoelzl, E., and Wahl, I. (2008). Enforced versus voluntary tax compliance: The “slippery slope” framework. *Journal of Economic Psychology*, 29(2):210–225.
- Konrad, K. A. and Qari, S. (2012). The last refuge of a scoundrel? Patriotism and tax compliance. *Economica*, 79(315):516–533.

- Lago-Peñas, I. and Lago-Peñas, S. (2010). The determinants of tax morale in comparative perspective: Evidence from European countries. *European Journal of Political Economy*, 26(4):441–453.
- Lewis, A. (1978). Perceptions of tax rates. *British Tax Review*, 6:358–366.
- Lewis, A. (1982). *The psychology of taxation*. Oxford: Martin Robertson.
- Martinez-Vazquez, J. and Torgler, B. (2009). The evolution of tax morale in modern Spain. *Journal of Economic Issues*, 43(1):1–28.
- McCombs, M. E. and Shaw, D. L. (1972). The agenda-setting function of mass media. *Public Opinion Quarterly*, 36(2):176–1987.
- McGee, R. W. and Ross, A. M. (2012). Education level and ethical attitude toward tax evasion: A six-country study. *Journal of Legal, Ethical and Regulatory Issues*, 15(2):93–138.
- Murphy, R. (2012). Closing the European tax gap. A report for group of the Progressive Alliance of Socialists & Democrats in the European Parliament. Technical report, Tax research LLP, Norfolk.
- Newton, K. and Norris, P. (2000). Confidence in public institutions: Faith, culture or performance. In *Disaffected democracies*. Princeton University Press.
- Niemirowski, P., Baldwin, S., and Wearing, A. J. (2003). The influence of tax related behaviours, beliefs, attitudes, and values on Australian taxpayer compliance. Is tax avoidance intentional and how serious an offence is it? *Journal of Australian Taxation*, 6(1):132–165.
- Norris, P. (2000). *A virtuous circle: Political communications in postindustrial societies*. Cambridge University Press.
- OECD (2009). Tax administration in OECD and selected non-OECD countries: Comparative information series (2008). Technical report, Centre for Tax Policy and Administration. Available at: <http://www.oecd.org/ctp/administration/CIS-2008.pdf>. Retrieved in March, 2015.
- OECD (2011). Tax administration in OECD and selected non-OECD countries: Comparative information series (2010). Technical report, Centre for Tax Policy and Administration. Available at: <http://www.oecd.org/ctp/administration/CIS-2010.pdf>. Retrieved in March, 2015.
- OECD (2016). Health spending indicator. OECD Database. Available at: <http://data.oecd.org>. Retrieved in August, 2015.
- Pickhardt, M. and Prinz, A. (2014). Behavioral dynamics of tax evasion - A survey. *Journal of Economic Psychology*, 40:1–19.
- Pommerehne, W. W. and Frey, B. S. (1992). The effects of tax administration on tax morale. ((No. Serie II, Nr. 191). Universität Konstanz, Juristische Fakultät.).
- Price, V. and Zaller, J. (1993). Who gets the news? Alternative measures of news reception and their implications for research. *Public Opinion Quarterly*, 57(2):133–164.
- Richardson, G. (2006). Determinants of tax evasion: A cross-country investigation. *Journal of International Accounting, Auditing and Taxation*, 15(2):150–169.

- Sigala, M., Burgoyne, C. B., and Webley, P. (1999). Tax communication and social influence : Evidence from a British sample. 241(June 1998).
- Sniderman, P. M., Brody, R. A., and Tetlock, P. E. (1993). *Reasoning and choice: Explorations in political psychology*. Cambridge University Press.
- Solt, F. (2014). The Standardized World Income Inequality Database. Available at: <http://dataverse.harvard.edu>. Retrieved in December, 2015.
- Stack, S. and Kposowa, A. (2006). The effect of religiosity on tax fraud acceptability : A cross-national analysis. *Journal for the Scientific Study of Religion*, 45:325–351.
- Tichenor, P. J., Donohue, G. A., and Olien, C. N. (1970). Mass media flow and differential growth in knowledge. *Public Opinion Quarterly*, 34(2):159–170.
- Torgler, B. (2004). Tax morale in Asian countries. *Journal of Asian Economics*, 15(2):237–266.
- Torgler, B. (2005a). Tax morale and direct democracy. *European Journal of Political Economy*, 21:525–531.
- Torgler, B. (2005b). Tax morale in Latin America. *Public Choice*, 122:133–157.
- Torgler, B. (2006). The importance of faith: Tax morale and religiosity. *Journal of Economic Behavior and Organization*, 61(1):81–109.
- Torgler, B. (2012). Tax morale, Eastern Europe and European enlargement. *Communist and Post-Communist Studies*, 45(1-2):11–25.
- Torgler, B., Demir, I. C., Macintyre, A., and Schaffner, M. (2008). Causes and consequences of tax morale: An empirical investigation. *Economic Analysis and Policy*, 38(2):313–339.
- Torgler, B. and Murphy, K. (2004). Tax morale in Australia: What shapes it and has it changed over time? *Journal of Australian Taxation*, 7:298.
- Torgler, B. and Valev, N. T. (2010). Gender and public attitudes toward corruption and tax evasion. *Contemporary Economic Policy*, 28(4):554–568.
- Transparency International (2008). Corruption Perceptions Index (2008). Available at: <http://www.transparency.org/>. Retrieved in December, 2015.
- Wenzel, M. (2004). An analysis of norm processes in tax compliance. *Journal of Economic Psychology*, 25(2):213–228.
- World Bank (2016). World Development Indicators. Available at: <http://data.worldbank.org/data-catalog/world-development-indicators>. Retrieved in February, 2016.
- Yitzhaki, S. (1974). A note on income tax evasion: A theoretical analysis. *Journal of Public Economics*, 3:201–202.

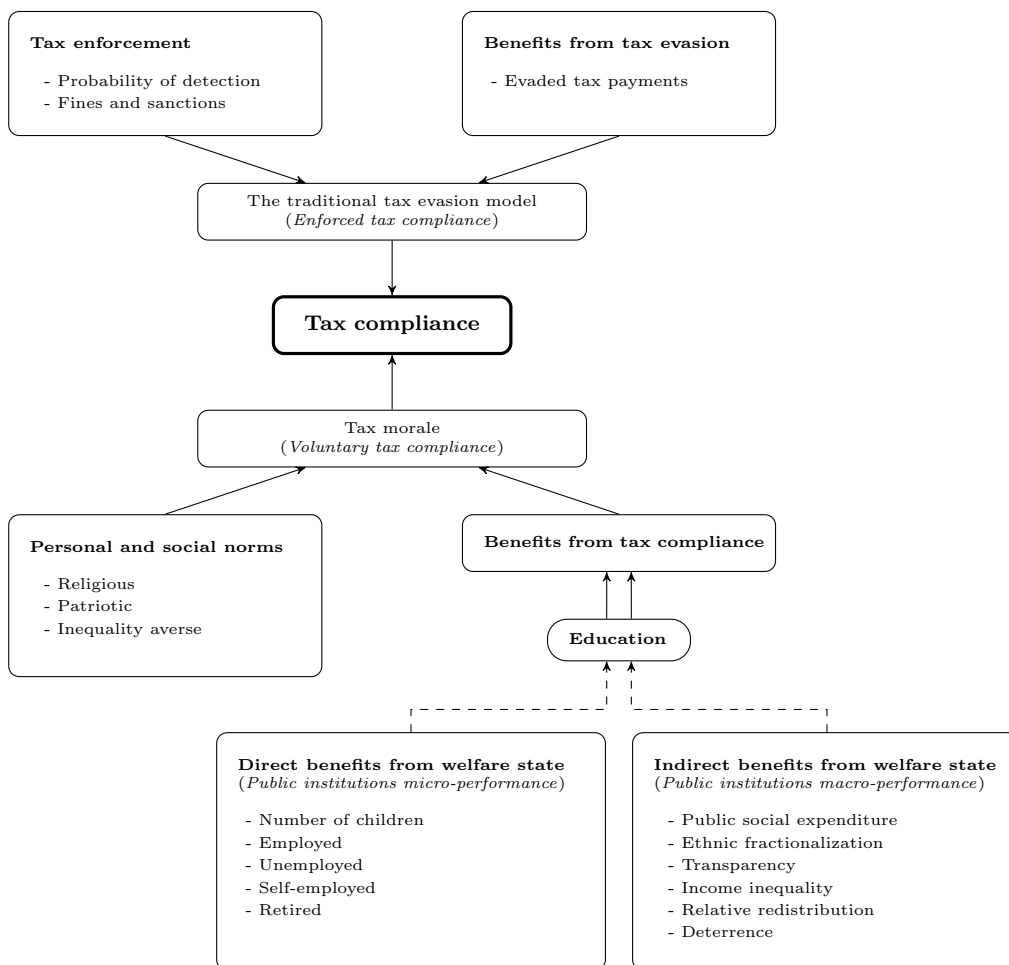


Figure 1: Education and tax compliance.

Variable	Definition	Measurement	Source
Tax morale	Respondents' tax morale	Rescaled into a four-point scale. Responses 7 through 10 were combined into a value 0 (low tax morale), while the remaining responses were combined in groups of two (5 and 6 into 1; 3 and 4 into 2; 1 and 2 into 3).	EVS (2011).
Education	Respondents' educational level	Three dummy variables (low, medium and high) accounting for if the respondent has adequately or inadequately completed primary (compulsory), secondary or tertiary education respectively.	EVS (2011).
Religious	Respondents' religious beliefs	Dichotomous variable taking value 1 if the respondent declares to be a religious person and 0 otherwise (not religious or convinced atheist).	EVS (2011).
Patriotic	Respondents' patriotic feelings	Dichotomous variable taking value 1 if the respondent declares to be very or quite proud of being a citizen of the country and 0 otherwise (not very or not at all proud).	EVS (2011).
Inequality-averse	Respondents' inequality-aversion inclination	Dummy variable taking value 1 for the first two points in a ten-point scaled answer where the respondents place their views on income equality (where value 1 stands for "incomes should be made more equal", and 10 "there should be greater incentives for individual effort").	EVS (2011).
Number of children	Respondents' number of children at home	Continuous variable accounting for the individuals' number of children at home.	EVS (2011).
Unemployed	Respondents' employment status	Dichotomous variable taking value 1 if the respondent is currently unemployed and 0 otherwise.	EVS (2011).
Self-employed	Respondents' employment status	Dichotomous variable taking value 1 if the respondent is currently self-employed and 0 otherwise.	EVS (2011).
Retired	Respondents' employment status	Dichotomous variable taking value 1 if the respondent is retired/pensioned and 0 otherwise.	EVS (2011).
Other	Respondents' employment status	Dichotomous variable taking value 1 if the respondent is (military service, housewife not otherwise employed, student, not working because of disability, other reasons) and 0 otherwise.	EVS (2011).
Income	Respondents' income level	Three dummy variables (low, medium and high) accounting for the respondent's income level.	EVS (2011).
Age	Respondents' age	Respondent's age calculated using the year of birth.	EVS (2011).
Gender	Respondents' gender	Dichotomous variable taking value 1 for female and 0 for male.	EVS (2011).

Table 1: Data definitions and sources.

Variable	Definition	Measurement	Source
Married	Respondents' marital status as married	Dichotomous variable taking value 1 if the respondent is currently married or in union and 0 otherwise.	EVS (2011) .
Widowed	Respondents' marital status as widowed	Dichotomous variable taking value 1 if the respondent is currently widowed and 0 otherwise.	EVS (2011) .
Divorced	Respondents' marital status as divorced	Dichotomous variable taking value 1 if the respondent is currently divorced or separated and 0 otherwise.	EVS (2011) .
Natural-born citizen	Country citizenship obtained by birth	Dichotomous variable taking value 1 if the respondent obtained the country citizenship by birth and 0 otherwise.	EVS (2011) .
Public social expenditure	Public healthcare, education and social expenditure	Measured as the share of public health, education and social benefits expenditure in GDP.	EUROSTAT (2016) . Health expenditure data for AUT, GRE, IRL, ITA, TUR, UK is from OECD (2016) .
Ethnic fractionalization	Fractionalization index of ethnic groups by country	$Fractionalization_j = 1 - \sum_{i=1}^n s_{ij}^2$ with s_{ij} being the share of group i in country j	Alesina et al. (2003) .
Transparency	Corruption Perceptions Index	Measures the perceived levels of public-sector corruption in a given country on a scale from zero (highly corrupt) to ten (highly clean).	Transparency International (2008) .
Income inequality	Pre-taxes Gini index	Estimate of Gini index of inequality in equivalized (square root scale) household market (pre-tax and pre-transfer) income	Solt (2014) .
Relative redistribution	The percentage reduction in market-income inequality due to taxes and transfers	The difference between the post-tax gini and pre tax gini, divided by pre-tax gini, multiplied by 100	Own construction using data from Solt (2014) .
Deterrence	Deterrence power of the administration	Number of tax administration staff as a proportion of total labor force multiplied by the value of completed audits as a proportion of total net collections	Own construction using data from OECD (2009, 2011) . Total labor force has been taken from the World Bank (2016) .

Table 1: Continued. Data definitions and sources.

Variable	Mean	Std. Dev.	Min	Max
<i>Individual-level variables</i>				
Religious	0.653	0.476	0	1
Patriotic	0.886	0.318	0	1
Inequality averse	0.232	0.422	0	1
Natural-born citizen	0.958	0.201	0	1
Number of children	0.926	1.349	0	13
Age	48.505	17.557	16	108
Gender	0.548	0.498	0	1
<i>Country-level variables</i>				
Public social expenditure	32.718	7.892	18.760	46.590
Ethnic fractionalization	0.255	0.162	0.047	0.587
Transparency	6.252	1.718	3.600	9.300
Income inequality	46.685	5.105	33.752	58.393
Relative redistribution	35.398	11.697	3.626	48.858
Deterrence	0.839	0.732	0.007	3.045

Table 2: Descriptive statistics of dummy and continuous variables

Variable	Value	Frequency	Percent
Tax morale	Low (0)	1,710	5.96
	Medium Low (1)	2,543	8.86
	Medium High (2)	3,932	13.69
	High (3)	20,530	71.50
	<i>Total</i>	28,715	100
Educational level	Low	4,334	15.09
	Medium	17,924	62.42
	High	6,457	22.49
	<i>Total</i>	28,715	100
Occupational status	Employed	13,677	47.63
	Unemployed	1,734	6.04
	Self-employed	1,514	5.27
	Retired	7,345	25.58
	Other	4,445	15.48
	<i>Total</i>	28,715	100
Income level	Low	9,522	33.16
	Medium	10,641	37.06
	High	8,552	29.78
	<i>Total</i>	28,715	100
Marital status	Never married	6,665	23.21
	Married / partnership	16,160	56.28
	Widowed	3,118	10.86
	Divorced / separated	2,772	9.65
	<i>Total</i>	28,715	100

Table 3: Descriptive statistics of categorical variables.

	I	II	III	IV	V	VI	VII	VIII
Medium education (Ref.: low)	-0.132** (0.055)	-0.107** (0.048)	-1.061*** (0.361)	-0.044 (0.104)	-0.680 (0.428)	-1.212 (0.798)	-0.662*** (0.143)	-0.121 (0.079)
High education (Ref.: low)	0.004 (0.064)	0.013 (0.051)	-1.296*** (0.410)	0.226** (0.112)	-0.930** (0.451)	-0.927 (0.798)	-0.784*** (0.216)	-0.028 (0.099)
Personal and social norms								
Religious (Ref.: non religious)	0.160*** (0.031)	0.160*** (0.031)	0.107*** (0.034)	0.118** (0.049)	0.120*** (0.041)	0.120*** (0.045)	0.081** (0.036)	0.098** (0.045)
Patriotic (Ref.: non patriotic)	0.259*** (0.037)	0.259*** (0.037)	0.280*** (0.051)	0.259*** (0.049)	0.275*** (0.050)	0.269*** (0.042)	0.288*** (0.053)	0.285*** (0.051)
Inequality averse	0.092*** (0.034)	0.092*** (0.034)	0.123** (0.048)	0.109** (0.046)	0.125*** (0.047)	0.118*** (0.045)	0.127*** (0.047)	0.116** (0.049)
Direct benefits								
Number of children	0.009 (0.013)	0.023*** (0.006)	0.023*** (0.006)	0.026*** (0.007)	0.026*** (0.006)	0.025*** (0.006)	0.023*** (0.006)	0.029*** (0.006)
x medium education	0.022 (0.017)							
x high education	0.006 (0.022)							
Unemployed (Ref.: employed)	-0.280** (0.111)	-0.286*** (0.107)	-0.093 (0.146)	0.029 (0.187)	-0.012 (0.165)	-0.070 (0.156)	-0.189 (0.127)	0.001 (0.169)
x medium education	0.309*** (0.113)	0.314*** (0.110)	0.199 (0.125)	0.082 (0.145)	0.124 (0.130)	0.181 (0.128)	0.272** (0.117)	0.094 (0.129)
x high education	0.337** (0.141)	0.346** (0.137)	0.217 (0.151)	0.086 (0.157)	0.153 (0.151)	0.188 (0.151)	0.293** (0.148)	0.106 (0.150)
Self-employed (Ref.: employed)	0.146 (0.100)	0.142 (0.103)	0.227** (0.110)	0.334** (0.168)	0.273** (0.133)	0.247* (0.133)	0.136 (0.103)	0.295* (0.161)
x medium education	-0.322*** (0.108)	-0.317*** (0.110)	-0.353*** (0.099)	-0.477*** (0.147)	-0.397*** (0.115)	-0.378*** (0.120)	-0.277*** (0.107)	-0.432*** (0.149)
x high education	-0.431*** (0.130)	-0.428*** (0.133)	-0.461*** (0.127)	-0.607*** (0.169)	-0.487*** (0.143)	-0.476*** (0.137)	-0.371*** (0.131)	-0.555*** (0.170)
Retired (Ref.: employed)	-0.070 (0.063)	-0.062 (0.061)	-0.101 (0.098)	-0.120 (0.090)	-0.132 (0.087)	-0.142 (0.088)	-0.108 (0.090)	-0.137 (0.088)
x medium education	0.216*** (0.073)	0.203*** (0.071)	0.269** (0.109)	0.313*** (0.113)	0.325*** (0.114)	0.309*** (0.103)	0.251*** (0.093)	0.313*** (0.108)
x high education	0.184* (0.097)	0.180* (0.094)	0.282** (0.134)	0.325** (0.135)	0.338** (0.135)	0.338*** (0.128)	0.269** (0.119)	0.323*** (0.125)
Other (Ref.: employed)	-0.065 (0.069)	-0.066 (0.069)	0.088 (0.073)	0.221 (0.151)	0.181 (0.119)	0.103 (0.104)	-0.009 (0.068)	0.194 (0.145)
x medium education	0.137* (0.075)	0.137* (0.076)	-0.008 (0.066)	-0.144 (0.127)	-0.101 (0.096)	-0.025 (0.093)	0.084 (0.075)	-0.117 (0.122)
x high education	-0.015 (0.087)	-0.011 (0.088)	-0.109 (0.092)	-0.259** (0.120)	-0.203** (0.093)	-0.148 (0.094)	-0.034 (0.095)	-0.242** (0.116)
Controls								
Medium income (Ref.: low)	-0.001 (0.030)	-0.000 (0.030)	0.008 (0.039)	0.023 (0.036)	0.013 (0.041)	0.010 (0.040)	0.000 (0.037)	0.020 (0.041)
High income (Ref.: low)	-0.033 (0.050)	-0.033 (0.050)	-0.037 (0.052)	-0.027 (0.053)	-0.031 (0.054)	-0.038 (0.056)	-0.047 (0.051)	-0.030 (0.054)
Age	0.009*** (0.001)	0.009*** (0.001)	0.008*** (0.001)	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.009*** (0.001)	0.008*** (0.002)
Gender (Ref.: male)	0.185*** (0.027)	0.186*** (0.027)	0.165*** (0.033)	0.165*** (0.037)	0.162*** (0.037)	0.166*** (0.032)	0.170*** (0.028)	0.162*** (0.036)
Married (Ref.: never married)	0.018 (0.022)	0.020 (0.023)	0.020 (0.026)	0.036 (0.029)	0.028 (0.027)	0.021 (0.027)	0.000 (0.028)	0.016 (0.031)
Widowed (Ref.: never married)	-0.047 (0.037)	-0.045 (0.038)	-0.080** (0.033)	-0.035 (0.047)	-0.062 (0.041)	-0.067 (0.047)	-0.105** (0.043)	-0.070 (0.055)
Divorced (Ref.: never married)	-0.121*** (0.033)	-0.120*** (0.034)	-0.131*** (0.040)	-0.113*** (0.037)	-0.125*** (0.042)	-0.117*** (0.037)	-0.140*** (0.042)	-0.130*** (0.045)
Natural-born citizen	-0.166*** (0.048)	-0.166*** (0.048)	-0.131** (0.056)	-0.145** (0.059)	-0.122** (0.053)	-0.127** (0.055)	-0.151*** (0.056)	-0.154*** (0.055)

	I	II	III	IV	V	VI	VII	VIII
Indirect benefits								
Public social expenditure			-0.027** (0.014)					
x medium education			0.027** (0.011)					
x high education			0.036*** (0.013)					
Ethnic fractionalization				0.184 (0.501)				
x medium education				-0.697* (0.406)				
x high education				-1.321*** (0.434)				
Transparency					-0.068 (0.073)			
x medium education					0.075 (0.060)			
x high education					0.128* (0.066)			
Income inequality						-0.036* (0.019)		
x medium education						0.020 (0.016)		
x high education						0.017 (0.016)		
Relative redistribution							-0.025*** (0.005)	
x medium education							0.015*** (0.004)	
x high education							0.021*** (0.006)	
Deterrence								0.241* (0.144)
x medium education								-0.132 (0.129)
x high education								-0.094 (0.131)
Constant cut1	-1.202*** (0.115)	-1.179*** (0.107)	-1.922*** (0.496)	-1.058*** (0.153)	-1.477*** (0.526)	-2.794*** (0.949)	-1.859*** (0.213)	-0.888*** (0.110)
Constant cut2	-0.644*** (0.114)	-0.622*** (0.107)	-1.389*** (0.496)	-0.522*** (0.153)	-0.944* (0.527)	-2.260** (0.951)	-1.324*** (0.212)	-0.355*** (0.112)
Constant cut3	-0.124 (0.118)	-0.102 (0.111)	-0.893* (0.500)	-0.024 (0.160)	-0.449 (0.533)	-1.763* (0.953)	-0.826*** (0.213)	0.142 (0.119)
Observations	28,715	28,715	28,715	28,715	28,715	28,715	28,715	28,715
Countries FE	YES	YES	NO	NO	NO	NO	NO	NO
Pseudo R2	0.0598	0.0597	0.0277	0.0304	0.0268	0.0291	0.0313	0.0285

Table 4: Estimation results. Ordered probit with clustered standard errors by country (29 clusters). Robust standard errors in parentheses where *** indicate $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$, respectively.

	I	II	III	IV	V	VI	VII	VIII
Medium education (Ref.: low)	-0.073 (0.059)	-0.053 (0.055)	-1.066*** (0.302)	0.009 (0.091)	-0.636 (0.400)	-1.147 (0.714)	-0.566*** (0.130)	-0.119* (0.071)
High education (Ref.: low)	0.040 (0.067)	0.045 (0.058)	-1.235*** (0.352)	0.204** (0.095)	-0.834** (0.418)	-0.995 (0.718)	-0.671*** (0.211)	-0.043 (0.090)
Personal and social norms								
Religious (Ref.: non religious)	0.150*** (0.027)	0.151*** (0.027)	0.117*** (0.032)	0.128*** (0.047)	0.129*** (0.039)	0.128*** (0.044)	0.092*** (0.033)	0.107** (0.042)
Patriotic (Ref.: non patriotic)	0.243*** (0.033)	0.243*** (0.033)	0.266*** (0.049)	0.246*** (0.047)	0.262*** (0.047)	0.257*** (0.040)	0.274*** (0.050)	0.273*** (0.048)
Inequality averse	0.123*** (0.029)	0.123*** (0.029)	0.152*** (0.043)	0.139*** (0.041)	0.154*** (0.041)	0.149*** (0.039)	0.157*** (0.042)	0.145*** (0.043)
Direct benefits								
Number of children	0.009 (0.013)	0.019*** (0.006)	0.018*** (0.005)	0.023*** (0.006)	0.023*** (0.006)	0.021*** (0.005)	0.019*** (0.005)	0.025*** (0.006)
x medium education	0.017 (0.016)							
x high education	0.002 (0.019)							
Unemployed (Ref.: employed)	-0.179 (0.127)	-0.183 (0.123)	-0.023 (0.156)	0.103 (0.193)	0.065 (0.174)	0.015 (0.167)	-0.099 (0.141)	0.083 (0.179)
x medium education	0.198* (0.119)	0.202* (0.115)	0.119 (0.127)	-0.004 (0.145)	0.035 (0.132)	0.085 (0.131)	0.172 (0.121)	-0.002 (0.133)
x high education	0.244* (0.137)	0.252* (0.133)	0.157 (0.146)	0.030 (0.156)	0.079 (0.147)	0.115 (0.148)	0.213 (0.141)	0.035 (0.146)
Self-employed (Ref.: employed)	0.209** (0.103)	0.207** (0.103)	0.289** (0.123)	0.394** (0.181)	0.335** (0.151)	0.317** (0.150)	0.208* (0.116)	0.359** (0.174)
x medium education	-0.354*** (0.103)	-0.350*** (0.104)	-0.381*** (0.099)	-0.503*** (0.157)	-0.426*** (0.129)	-0.414*** (0.131)	-0.315*** (0.108)	-0.465*** (0.159)
x high education	-0.476*** (0.122)	-0.474*** (0.123)	-0.500*** (0.122)	-0.636*** (0.170)	-0.529*** (0.150)	-0.526*** (0.143)	-0.423*** (0.128)	-0.599*** (0.172)
Retired (Ref.: employed)	0.015 (0.065)	0.020 (0.063)	-0.022 (0.093)	-0.044 (0.077)	-0.055 (0.072)	-0.061 (0.080)	-0.027 (0.087)	-0.060 (0.072)
x medium education	0.128* (0.067)	0.117* (0.066)	0.190** (0.094)	0.238*** (0.092)	0.249*** (0.091)	0.232*** (0.087)	0.172** (0.082)	0.237*** (0.086)
x high education	0.126 (0.092)	0.125 (0.090)	0.229* (0.119)	0.277** (0.115)	0.287** (0.113)	0.281** (0.111)	0.214** (0.107)	0.272*** (0.104)
Other (Ref.: employed)	-0.039 (0.059)	-0.040 (0.059)	0.112* (0.067)	0.247* (0.135)	0.211** (0.104)	0.148 (0.096)	0.028 (0.064)	0.225* (0.126)
x medium education	0.098 (0.062)	0.098 (0.062)	-0.036 (0.056)	-0.176 (0.109)	-0.136* (0.077)	-0.074 (0.082)	0.041 (0.064)	-0.154 (0.100)
x high education	-0.013 (0.086)	-0.010 (0.086)	-0.105 (0.093)	-0.253** (0.114)	-0.205** (0.088)	-0.163* (0.096)	-0.045 (0.094)	-0.244** (0.108)
Controls								
Medium income (Ref.: low)	-0.027 (0.028)	-0.027 (0.028)	-0.014 (0.035)	0.002 (0.034)	-0.009 (0.037)	-0.011 (0.036)	-0.022 (0.034)	0.000 (0.035)
High income (Ref.: low)	-0.071 (0.044)	-0.071 (0.044)	-0.069 (0.046)	-0.058 (0.047)	-0.063 (0.048)	-0.068 (0.050)	-0.079* (0.045)	-0.060 (0.047)
Age	0.008*** (0.001)	0.008*** (0.001)	0.007*** (0.002)	0.006** (0.003)	0.006*** (0.002)	0.007*** (0.002)	0.008*** (0.001)	0.007*** (0.002)
Gender (Ref.: male)	0.174*** (0.025)	0.174*** (0.025)	0.153*** (0.032)	0.153*** (0.036)	0.149*** (0.035)	0.153*** (0.031)	0.157*** (0.027)	0.151*** (0.035)
Married (Ref.: never married)	0.034* (0.020)	0.036* (0.020)	0.037 (0.025)	0.053* (0.028)	0.045* (0.026)	0.039 (0.027)	0.019 (0.028)	0.034 (0.030)
Widowed (Ref.: never married)	-0.050 (0.035)	-0.049 (0.035)	-0.082** (0.035)	-0.038 (0.046)	-0.064 (0.040)	-0.070 (0.044)	-0.107** (0.043)	-0.070 (0.052)
Divorced (Ref.: never married)	-0.094*** (0.028)	-0.093*** (0.029)	-0.102*** (0.037)	-0.084** (0.034)	-0.096** (0.039)	-0.091*** (0.035)	-0.111*** (0.039)	-0.099** (0.042)
Natural-born citizen	-0.156*** (0.045)	-0.156*** (0.045)	-0.119** (0.051)	-0.131** (0.056)	-0.112** (0.047)	-0.114** (0.051)	-0.138*** (0.052)	-0.145*** (0.051)

	I	II	III	IV	V	VI	VII	VIII
Indirect benefits								
Public social expenditure			-0.028** (0.012)					
x medium education			0.028*** (0.009)					
x high education			0.035*** (0.011)					
Ethnic fractionalization				0.259 (0.486)				
x medium education				-0.795** (0.386)				
x high education				-1.250*** (0.407)				
Transparency					-0.067 (0.069)			
x medium education					0.073 (0.057)			
x high education					0.114* (0.062)			
Income inequality						-0.033* (0.017)		
x medium education						0.020 (0.015)		
x high education						0.018 (0.015)		
Relative redistribution							-0.023*** (0.004)	
x medium education							0.013*** (0.003)	
x high education							0.018*** (0.005)	
Deterrence								0.221* (0.131)
x medium education								-0.094 (0.115)
x high education								-0.066 (0.118)
Constant cut1	-1.754*** (0.120)	-1.737*** (0.120)	-2.533*** (0.443)	-1.641*** (0.146)	-2.067*** (0.514)	-3.234*** (0.872)	-2.379*** (0.205)	-1.504*** (0.101)
Constant cut2	-1.623*** (0.114)	-1.606*** (0.113)	-2.405*** (0.438)	-1.513*** (0.142)	-1.939*** (0.509)	-3.106*** (0.869)	-2.251*** (0.198)	-1.376*** (0.099)
Constant cut3	-1.368*** (0.106)	-1.350*** (0.103)	-2.158*** (0.433)	-1.264*** (0.139)	-1.691*** (0.503)	-2.859*** (0.866)	-2.004*** (0.189)	-1.128*** (0.097)
Constant cut4	-1.146*** (0.105)	-1.129*** (0.102)	-1.944*** (0.432)	-1.049*** (0.141)	-1.478*** (0.503)	-2.646*** (0.865)	-1.791*** (0.186)	-0.914*** (0.101)
Constant cut5	-0.944*** (0.107)	-0.927*** (0.104)	-1.750*** (0.434)	-0.854*** (0.142)	-1.284** (0.505)	-2.451*** (0.865)	-1.596*** (0.187)	-0.720*** (0.103)
Constant cut6	-0.591*** (0.103)	-0.574*** (0.100)	-1.412*** (0.432)	-0.514*** (0.139)	-0.946* (0.504)	-2.113** (0.867)	-1.257*** (0.185)	-0.381*** (0.102)
Constant cut7	-0.389*** (0.105)	-0.372*** (0.102)	-1.219*** (0.434)	-0.320** (0.142)	-0.753 (0.506)	-1.919** (0.867)	-1.063*** (0.185)	-0.188* (0.105)
Constant cut8	-0.072 (0.105)	-0.055 (0.102)	-0.916** (0.435)	-0.016 (0.145)	-0.451 (0.509)	-1.616* (0.869)	-0.759*** (0.184)	0.115 (0.108)
Constant cut9	0.311*** (0.108)	0.328*** (0.104)	-0.549 (0.433)	0.352** (0.149)	-0.084 (0.507)	-1.248 (0.867)	-0.390** (0.181)	0.483*** (0.109)
Observations	28,715	28,715	28,715	28,715	28,715	28,715	28,715	28,715
Countries FE	NO	NO	NO	NO	NO	NO	NO	NO
Pseudo R2	0.0421	0.0421	0.0206	0.0220	0.0196	0.0209	0.0230	0.0215

Table 5: Estimation results. Ordered probit with clustered standard errors by country (29 countries). Robust standard errors in parentheses where *** indicate $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$, respectively. The independent variable is tax morale in a ten-point scale.

	I	II	III	IV	V	VI	VII	VIII
Medium education (Ref.: low)	-0.108** (0.048)	-0.079* (0.043)	-0.908*** (0.332)	-0.017 (0.093)	-0.568 (0.388)	-0.980 (0.746)	-0.588*** (0.134)	-0.090 (0.073)
High education (Ref.: low)	0.028 (0.057)	0.040 (0.046)	-1.130*** (0.374)	0.238** (0.101)	-0.801** (0.409)	-0.666 (0.741)	-0.681*** (0.191)	0.003 (0.092)
Personal and social norms								
Religious (Ref.: non religious)	0.144*** (0.028)	0.144*** (0.029)	0.091*** (0.031)	0.101** (0.045)	0.105*** (0.037)	0.101** (0.041)	0.067** (0.033)	0.082** (0.041)
Patriotic (Ref.: non patriotic)	0.253*** (0.035)	0.253*** (0.035)	0.272*** (0.048)	0.252*** (0.045)	0.267*** (0.046)	0.262*** (0.039)	0.279*** (0.049)	0.277*** (0.047)
Inequality averse	0.060** (0.030)	0.060** (0.030)	0.088* (0.045)	0.075* (0.043)	0.090** (0.044)	0.084* (0.043)	0.091** (0.045)	0.082* (0.046)
Direct benefits								
Number of children	0.003 (0.012)	0.020*** (0.006)	0.020*** (0.006)	0.023*** (0.006)	0.023*** (0.006)	0.023*** (0.006)	0.020*** (0.006)	0.026*** (0.006)
x medium education	0.026* (0.016)							
x high education	0.008 (0.020)							
Unemployed (Ref.: employed)	-0.250*** (0.092)	-0.256*** (0.088)	-0.077 (0.126)	0.037 (0.159)	-0.000 (0.142)	-0.054 (0.132)	-0.165 (0.109)	0.006 (0.143)
x medium education	0.275*** (0.094)	0.281*** (0.090)	0.171 (0.109)	0.061 (0.122)	0.100 (0.111)	0.152 (0.108)	0.240** (0.101)	0.076 (0.108)
x high education	0.264** (0.124)	0.275** (0.121)	0.151 (0.135)	0.030 (0.136)	0.089 (0.133)	0.124 (0.134)	0.223* (0.133)	0.053 (0.132)
Self-employed (Ref.: employed)	0.133 (0.098)	0.128 (0.099)	0.210* (0.114)	0.303* (0.164)	0.254* (0.138)	0.230* (0.135)	0.129 (0.105)	0.266* (0.155)
x medium education	-0.295*** (0.099)	-0.288*** (0.101)	-0.327*** (0.096)	-0.437*** (0.140)	-0.369*** (0.117)	-0.352*** (0.117)	-0.260*** (0.100)	-0.394*** (0.139)
x high education	-0.404*** (0.126)	-0.400*** (0.127)	-0.438*** (0.126)	-0.569*** (0.163)	-0.462*** (0.145)	-0.455*** (0.137)	-0.358*** (0.127)	-0.517*** (0.162)
Retired (Ref.: employed)	-0.046 (0.060)	-0.037 (0.057)	-0.078 (0.090)	-0.095 (0.083)	-0.103 (0.080)	-0.113 (0.081)	-0.083 (0.083)	-0.110 (0.081)
x medium education	0.182*** (0.067)	0.166** (0.065)	0.232** (0.100)	0.270*** (0.104)	0.281*** (0.104)	0.266*** (0.095)	0.215** (0.085)	0.270*** (0.098)
x high education	0.145 (0.091)	0.140 (0.088)	0.239* (0.124)	0.277** (0.125)	0.288** (0.125)	0.287** (0.120)	0.226** (0.112)	0.276** (0.117)
Other (Ref.: employed)	-0.050 (0.068)	-0.051 (0.068)	0.076 (0.072)	0.194 (0.142)	0.158 (0.112)	0.092 (0.100)	-0.011 (0.068)	0.165 (0.134)
x medium education	0.116 (0.073)	0.116 (0.073)	-0.006 (0.066)	-0.127 (0.122)	-0.089 (0.092)	-0.023 (0.091)	0.077 (0.075)	-0.097 (0.115)
x high education	-0.048 (0.079)	-0.044 (0.080)	-0.123 (0.083)	-0.255** (0.112)	-0.207** (0.083)	-0.165* (0.088)	-0.057 (0.089)	-0.237** (0.106)
Controls								
Medium income (Ref.: low)	0.005 (0.029)	0.005 (0.029)	0.013 (0.038)	0.028 (0.035)	0.017 (0.039)	0.013 (0.038)	0.006 (0.036)	0.024 (0.038)
High income (Ref.: low)	-0.023 (0.046)	-0.024 (0.046)	-0.026 (0.049)	-0.015 (0.049)	-0.020 (0.051)	-0.028 (0.052)	-0.035 (0.048)	-0.020 (0.050)
Age	0.008*** (0.001)	0.008*** (0.001)	0.007*** (0.001)	0.006*** (0.002)	0.006*** (0.002)	0.007*** (0.002)	0.008*** (0.001)	0.007*** (0.002)
Gender (Ref.: male)	0.175*** (0.026)	0.176*** (0.026)	0.160*** (0.030)	0.161*** (0.034)	0.158*** (0.033)	0.162*** (0.029)	0.164*** (0.026)	0.159*** (0.033)
Married (Ref.: never married)	0.013 (0.021)	0.016 (0.022)	0.014 (0.024)	0.029 (0.028)	0.022 (0.026)	0.015 (0.026)	-0.004 (0.027)	0.010 (0.030)
Widowed (Ref.: never married)	-0.044 (0.035)	-0.042 (0.036)	-0.075** (0.032)	-0.034 (0.044)	-0.057 (0.039)	-0.064 (0.044)	-0.098** (0.041)	-0.067 (0.051)
Divorced (Ref.: never married)	-0.122*** (0.030)	-0.121*** (0.031)	-0.129*** (0.036)	-0.113*** (0.034)	-0.124*** (0.038)	-0.118*** (0.033)	-0.138*** (0.038)	-0.130*** (0.041)
Natural-born citizen	-0.144*** (0.044)	-0.144*** (0.044)	-0.112** (0.053)	-0.127** (0.055)	-0.103** (0.049)	-0.110** (0.051)	-0.131** (0.052)	-0.134*** (0.052)

	I	II	III	IV	V	VI	VII	VIII
Indirect benefits			-0.024*					
Public social expenditure			(0.013)					
x medium education			0.023**					
x high education			(0.010)					
Ethnic fractionalization			0.033***					
x medium education			(0.012)	0.124				
x high education				(0.455)				
Transparency				-0.622*				
x medium education				(0.363)				
x high education				-1.192***				
Income inequality				(0.391)				
x medium education					-0.055			
x high education					(0.067)			
Relative redistribution					0.064			
x medium education					(0.055)			
x high education					0.114*			
Deterrence					(0.060)			
x medium education						-0.031*		
x high education						(0.018)		
Constant	0.599***	0.573***	1.199***	0.452***	0.786	1.919**	1.157***	0.293***
	(0.108)	(0.102)	(0.455)	(0.148)	(0.479)	(0.884)	(0.206)	(0.108)
Observations	28,715	28,715	28,715	28,715	28,715	28,715	28,715	28,715
Countries FE	YES	YES	NO	NO	NO	NO	NO	NO
AIC	.734568	.7345047	.7686598	.7653929	.7694225	.7672753	.7653959	.7678534
BIC	-278892	-278910.4	-277913.1	-278006.9	-277891.2	-277952.8	-278006.8	-277936.2

Table 6: Estimation results. GLM with clustered standard errors by country (29 clusters). Robust standard errors in parentheses where *** indicate $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$, respectively.

	I	II	III	IV	V	VI	VII	VIII
Medium income (Ref.: low)	-0.031 (0.044)	-0.017 (0.040)	0.094 (0.196)	0.078 (0.061)	0.110 (0.150)	0.498 (0.311)	0.175* (0.091)	-0.043 (0.056)
High income (Ref.: low)	-0.064 (0.069)	-0.054 (0.059)	-0.262 (0.226)	0.104 (0.104)	-0.124 (0.181)	0.371 (0.485)	0.060 (0.098)	-0.107 (0.068)
Personal and social norms								
Religious (Ref.: non religious)	0.161*** (0.031)	0.161*** (0.031)	0.108*** (0.035)	0.118** (0.050)	0.124*** (0.043)	0.125*** (0.046)	0.079** (0.037)	0.102** (0.046)
Patriotic (Ref.: non patriotic)	0.261*** (0.037)	0.260*** (0.037)	0.286*** (0.054)	0.261*** (0.050)	0.278*** (0.051)	0.270*** (0.042)	0.295*** (0.053)	0.289*** (0.051)
Inequality averse	0.093*** (0.035)	0.093*** (0.035)	0.129*** (0.050)	0.112** (0.048)	0.129*** (0.048)	0.122*** (0.046)	0.128*** (0.048)	0.118** (0.050)
Direct benefits								
Number of children	0.012 (0.013)	0.022*** (0.007)	0.030*** (0.006)	0.028*** (0.008)	0.031*** (0.007)	0.027*** (0.007)	0.029*** (0.006)	0.030*** (0.007)
x medium income	0.018 (0.015)							
x high income	0.013 (0.017)							
Unemployed (Ref.: employed)	-0.011 (0.059)	-0.013 (0.059)	0.116 (0.084)	0.125 (0.090)	0.129 (0.091)	0.121 (0.088)	0.098 (0.077)	0.112 (0.090)
x medium income	0.018 (0.101)	0.022 (0.100)	-0.069 (0.093)	-0.064 (0.088)	-0.075 (0.096)	-0.063 (0.091)	-0.080 (0.089)	-0.064 (0.087)
x high income	-0.086 (0.099)	-0.084 (0.100)	-0.080 (0.119)	-0.098 (0.118)	-0.082 (0.118)	-0.119 (0.113)	-0.132 (0.107)	-0.092 (0.114)
Self-employed (Ref.: employed)	-0.166* (0.090)	-0.169* (0.089)	-0.066 (0.106)	-0.072 (0.115)	-0.058 (0.110)	-0.070 (0.106)	-0.089 (0.092)	-0.084 (0.115)
x medium income	-0.038 (0.086)	-0.034 (0.086)	-0.075 (0.081)	-0.091 (0.086)	-0.084 (0.084)	-0.082 (0.081)	-0.081 (0.076)	-0.072 (0.089)
x high income	0.009 (0.109)	0.013 (0.110)	-0.039 (0.109)	-0.052 (0.115)	-0.039 (0.111)	-0.044 (0.113)	-0.038 (0.104)	-0.043 (0.114)
Retired (Ref.: employed)	0.069 (0.045)	0.073 (0.044)	0.055 (0.045)	0.066 (0.048)	0.066 (0.045)	0.054 (0.047)	0.052 (0.046)	0.052 (0.051)
x medium income	0.064 (0.069)	0.057 (0.068)	0.092 (0.074)	0.086 (0.075)	0.085 (0.074)	0.088 (0.075)	0.081 (0.073)	0.085 (0.075)
x high income	0.042 (0.068)	0.037 (0.066)	0.082 (0.085)	0.063 (0.082)	0.081 (0.084)	0.078 (0.077)	0.063 (0.075)	0.062 (0.080)
Other (Ref.: employed)	0.024 (0.072)	0.023 (0.071)	0.058 (0.082)	0.058 (0.085)	0.060 (0.086)	0.053 (0.079)	0.053 (0.075)	0.059 (0.083)
x medium income	0.004 (0.087)	0.006 (0.087)	0.039 (0.093)	0.062 (0.096)	0.048 (0.095)	0.046 (0.088)	0.013 (0.087)	0.045 (0.091)
x high income	0.047 (0.085)	0.048 (0.086)	0.098 (0.093)	0.102 (0.096)	0.100 (0.095)	0.074 (0.091)	0.051 (0.087)	0.076 (0.092)
Controls								
Medium education (Ref.: low)	0.023 (0.051)	0.024 (0.051)	-0.126 (0.117)	-0.133 (0.148)	-0.140 (0.135)	-0.137 (0.122)	-0.054 (0.057)	-0.135 (0.133)
High education (Ref.: low)	0.116* (0.059)	0.117** (0.059)	-0.030 (0.110)	-0.042 (0.145)	-0.053 (0.127)	-0.033 (0.121)	0.051 (0.066)	-0.032 (0.132)
Age	0.009*** (0.001)	0.009*** (0.001)	0.008*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.008*** (0.002)	0.009*** (0.002)	0.008*** (0.002)
Gender (Ref.: male)	0.187*** (0.027)	0.187*** (0.027)	0.164*** (0.033)	0.166*** (0.036)	0.163*** (0.035)	0.169*** (0.031)	0.169*** (0.028)	0.166*** (0.034)
Married (Ref.: never married)	0.021 (0.024)	0.022 (0.024)	0.032 (0.027)	0.046 (0.034)	0.043 (0.031)	0.035 (0.032)	0.016 (0.028)	0.029 (0.036)
Widowed (Ref.: never married)	-0.044 (0.037)	-0.042 (0.037)	-0.068** (0.034)	-0.033 (0.049)	-0.045 (0.044)	-0.055 (0.050)	-0.093** (0.043)	-0.061 (0.055)
Divorced (Ref.: never married)	-0.119*** (0.033)	-0.119*** (0.033)	-0.125*** (0.041)	-0.107*** (0.039)	-0.119*** (0.043)	-0.108*** (0.040)	-0.133*** (0.041)	-0.123*** (0.046)
Natural-born citizen	-0.168*** (0.048)	-0.167*** (0.048)	-0.123** (0.058)	-0.133** (0.062)	-0.112** (0.055)	-0.124** (0.056)	-0.145** (0.057)	-0.146*** (0.057)

	I	II	III	IV	V	VI	VII	VIII
Indirect benefits								
Public social expenditure			-0.003 (0.010)					
x medium income			-0.003 (0.005)					
x high income			0.006 (0.007)					
Ethnic fractionalization				-0.253 (0.331)				
x medium income				-0.327* (0.182)				
x high income				-0.652** (0.285)				
Transparency					0.018 (0.035)			
x medium income					-0.020 (0.021)			
x high income					0.008 (0.026)			
Income inequality						-0.013 (0.011)		
x medium income						-0.011* (0.007)		
x high income						-0.009 (0.011)		
Relative redistribution							-0.009 (0.008)	
x medium income							-0.005** (0.003)	
x high income							-0.004 (0.003)	
Deterrence								0.093 (0.082)
x medium income								0.049 (0.053)
x high income								0.058 (0.070)
Constant cut1	-1.077*** (0.107)	-1.068*** (0.103)	-1.068** (0.433)	-1.079*** (0.183)	-0.857*** (0.318)	-1.579*** (0.593)	-1.212*** (0.347)	-0.904*** (0.174)
Constant cut2	-0.520*** (0.102)	-0.511*** (0.098)	-0.537 (0.435)	-0.544*** (0.183)	-0.326 (0.321)	-1.046* (0.596)	-0.679** (0.345)	-0.372** (0.174)
Constant cut3	-0.000 (0.108)	0.009 (0.103)	-0.044 (0.444)	-0.048 (0.192)	0.168 (0.330)	-0.550 (0.600)	-0.182 (0.349)	0.124 (0.182)
Observations	28,715	28,715	28,715	28,715	28,715	28,715	28,715	28,715
Countries FE	YES	YES	NO	NO	NO	NO	NO	NO
Pseudo R2	0.0591	0.0591	0.0242	0.0277	0.0241	0.0275	0.0288	0.0266

Table 7: Estimation results. Ordered probit with clustered standard errors by country (29 clusters). Robust standard errors in parentheses where *** indicate $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$, respectively.

	I	II	III	IV	V	VI	VII	VIII
Medium education (Ref.: low)	-0.132** (0.055)	-0.107** (0.048)	-0.214** (0.108)	-0.202 (0.132)	-0.223* (0.119)	-0.246** (0.107)	-0.159** (0.066)	-0.222** (0.111)
High education (Ref.: low)	0.004 (0.064)	0.013 (0.051)	-0.104 (0.106)	-0.096 (0.132)	-0.121 (0.118)	-0.127 (0.109)	-0.036 (0.077)	-0.101 (0.113)
Personal and social norms								
Religious (Ref.: non religious)	0.160*** (0.031)	0.160*** (0.031)	0.107*** (0.034)	0.115** (0.049)	0.122*** (0.042)	0.121*** (0.045)	0.077** (0.036)	0.098** (0.045)
Patriotic (Ref.: non patriotic)	0.259*** (0.037)	0.259*** (0.037)	0.282*** (0.052)	0.258*** (0.049)	0.275*** (0.050)	0.268*** (0.042)	0.292*** (0.053)	0.286*** (0.051)
Inequality averse	0.092*** (0.034)	0.092*** (0.034)	0.127*** (0.049)	0.109** (0.047)	0.127*** (0.047)	0.120*** (0.045)	0.126*** (0.047)	0.116** (0.049)
Direct benefits								
Number of children	0.009 (0.013)	0.023*** (0.006)	0.029*** (0.006)	0.027*** (0.007)	0.030*** (0.006)	0.027*** (0.006)	0.029*** (0.006)	0.029*** (0.006)
x medium education	0.022 (0.017)							
x high education	0.006 (0.022)							
Unemployed (Ref.: employed)	-0.280** (0.111)	-0.286*** (0.107)	0.023 (0.179)	0.057 (0.182)	0.040 (0.190)	-0.014 (0.188)	-0.041 (0.158)	0.020 (0.187)
x medium education	0.309*** (0.113)	0.314*** (0.110)	0.080 (0.141)	0.050 (0.136)	0.073 (0.149)	0.122 (0.152)	0.119 (0.137)	0.074 (0.144)
x high education	0.337** (0.141)	0.346** (0.137)	0.096 (0.161)	0.068 (0.150)	0.085 (0.165)	0.126 (0.173)	0.121 (0.158)	0.089 (0.160)
Self-employed (Ref.: employed)	0.146 (0.100)	0.142 (0.103)	0.326** (0.151)	0.348* (0.183)	0.344** (0.162)	0.285* (0.155)	0.250** (0.118)	0.316* (0.172)
x medium education	-0.322*** (0.108)	-0.317*** (0.110)	-0.452*** (0.134)	-0.493*** (0.161)	-0.466*** (0.144)	-0.418*** (0.140)	-0.393*** (0.115)	-0.455*** (0.157)
x high education	-0.431*** (0.130)	-0.428*** (0.133)	-0.551*** (0.154)	-0.600*** (0.180)	-0.566*** (0.166)	-0.514*** (0.157)	-0.493*** (0.135)	-0.574*** (0.178)
Retired (Ref.: employed)	-0.070 (0.063)	-0.062 (0.061)	-0.118 (0.091)	-0.106 (0.097)	-0.112 (0.084)	-0.139 (0.088)	-0.118 (0.087)	-0.133 (0.089)
x medium education	0.216*** (0.073)	0.203*** (0.071)	0.304*** (0.112)	0.303** (0.122)	0.310*** (0.113)	0.314*** (0.105)	0.276*** (0.095)	0.309*** (0.110)
x high education	0.184* (0.097)	0.180* (0.094)	0.323** (0.136)	0.314** (0.142)	0.326** (0.134)	0.339*** (0.129)	0.295** (0.121)	0.318** (0.129)
Other (Ref.: employed)	-0.065 (0.069)	-0.066 (0.069)	0.219 (0.134)	0.264 (0.170)	0.238 (0.159)	0.159 (0.143)	0.122 (0.085)	0.212 (0.161)
x medium education	0.137* (0.075)	0.137* (0.076)	-0.140 (0.110)	-0.185 (0.142)	-0.158 (0.133)	-0.083 (0.126)	-0.052 (0.080)	-0.136 (0.137)
x high education	-0.015 (0.087)	-0.011 (0.088)	-0.261** (0.119)	-0.299** (0.134)	-0.278** (0.125)	-0.205* (0.116)	-0.193** (0.098)	-0.262** (0.128)
Controls								
Medium income (Ref.: low)	-0.001 (0.030)	-0.000 (0.030)	0.141 (0.187)	0.092 (0.064)	0.130 (0.143)	0.564* (0.325)	0.185* (0.097)	-0.017 (0.047)
High income (Ref.: low)	-0.033 (0.050)	-0.033 (0.050)	-0.173 (0.227)	0.124 (0.102)	-0.074 (0.177)	0.456 (0.480)	0.093 (0.101)	-0.079 (0.066)
Age	0.009*** (0.001)	0.009*** (0.001)	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.008*** (0.002)	0.007*** (0.002)
Gender (Ref.: male)	0.185*** (0.027)	0.186*** (0.027)	0.159*** (0.036)	0.161*** (0.039)	0.158*** (0.037)	0.164*** (0.033)	0.165*** (0.029)	0.162*** (0.036)
Married (Ref.: never married)	0.018 (0.022)	0.020 (0.023)	0.022 (0.026)	0.034 (0.029)	0.032 (0.028)	0.026 (0.028)	0.009 (0.028)	0.018 (0.032)
Widowed (Ref.: never married)	-0.047 (0.037)	-0.045 (0.038)	-0.073** (0.035)	-0.040 (0.047)	-0.053 (0.043)	-0.064 (0.043)	-0.099** (0.043)	-0.070 (0.054)
Divorced (Ref.: never married)	-0.121*** (0.033)	-0.120*** (0.034)	-0.130*** (0.041)	-0.113*** (0.038)	-0.126*** (0.042)	-0.115*** (0.038)	-0.137*** (0.042)	-0.130*** (0.045)
Natural-born citizen	-0.166*** (0.048)	-0.166*** (0.048)	-0.128** (0.057)	-0.141** (0.060)	-0.117** (0.054)	-0.128** (0.055)	-0.148*** (0.057)	-0.153*** (0.056)

	I	II	III	IV	V	VI	VII	VIII
Indirect benefits								
Public social expenditure			-0.001 (0.009)					
x medium income			-0.004 (0.005)					
x high income			0.004 (0.007)					
Ethnic fractionalization				-0.306 (0.316)				
x medium income				-0.281 (0.180)				
x high income				-0.601** (0.277)				
Transparency					0.020 (0.035)			
x medium income					-0.019 (0.021)			
x high income					0.006 (0.027)			
Income inequality						-0.011 (0.011)		
x medium income						-0.012* (0.007)		
x high income						-0.011 (0.010)		
Relative redistribution							-0.008 (0.007)	
x medium income							-0.005* (0.003)	
x high income							-0.004 (0.003)	
Deterrence								0.094 (0.082)
x medium income								0.044 (0.051)
x high income								0.058 (0.069)
Constant cut1	-1.202*** (0.115)	-1.179*** (0.107)	-1.108*** (0.386)	-1.177*** (0.180)	-0.938*** (0.284)	-1.617*** (0.558)	-1.298*** (0.324)	-1.003*** (0.159)
Constant cut2	-0.644*** (0.114)	-0.622*** (0.107)	-0.576 (0.389)	-0.641*** (0.182)	-0.406 (0.288)	-1.083* (0.561)	-0.764** (0.323)	-0.469*** (0.162)
Constant cut3	-0.124 (0.118)	-0.102 (0.111)	-0.081 (0.397)	-0.144 (0.191)	0.088 (0.297)	-0.586 (0.564)	-0.266 (0.327)	0.027 (0.169)
Observations	28,715	28,715	28,715	28,715	28,715	28,715	28,715	28,715
Countries FE	YES	YES	NO	NO	NO	NO	NO	NO
Pseudo R2	0.0598	0.0597	0.0259	0.0295	0.0259	0.0290	0.0300	0.0284

Table 8: Estimation results. Ordered probit with clustered standard errors by country (29 clusters). Robust standard errors in parentheses where *** indicate $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$, respectively.

	1	2	3	4	5	6	7	8	9	10	11	12
1 Tax morale	1.00											
2 Education	-0.05	1.00										
3 Religious	0.08	-0.15	1.00									
4 Patriotic	0.09	-0.07	0.11	1.00								
5 Inequality averse	0.04	-0.13	0.03	-0.02	1.00							
6 Number of children	0.03	-0.06	0.09	0.03	0.02	1.00						
7 Unemployed	0.00	-0.07	-0.01	-0.04	0.06	0.05	1.00					
8 Self-employed	-0.04	0.03	0.00	0.01	-0.02	0.05	-0.06	1.00				
9 Retired	0.10	-0.18	0.10	0.04	0.05	-0.20	-0.15	-0.14	1.00			
10 Other	0.01	-0.17	0.06	0.01	0.03	0.06	-0.11	-0.10	-0.25	1.00		
11 Income	-0.05	0.30	-0.08	0.00	-0.10	0.12	-0.14	0.07	-0.28	-0.06	1.00	
12 Age	0.13	-0.21	0.13	0.05	0.03	-0.08	-0.13	-0.04	0.70	-0.23	-0.25	1.00
13 Gender	0.08	-0.04	0.14	0.02	0.02	0.06	-0.03	-0.11	0.00	0.20	-0.08	0.02
14 Married	0.06	-0.01	0.10	0.05	0.01	0.32	-0.05	0.06	-0.01	-0.04	0.27	0.13
15 Widowed	0.06	-0.18	0.10	0.03	0.03	-0.09	-0.06	-0.06	0.39	-0.06	-0.28	0.43
16 Divorced	-0.03	0.05	-0.06	-0.05	-0.01	-0.03	0.02	0.00	-0.03	-0.06	-0.12	0.05
17 Natural-born citizen	-0.02	-0.03	-0.02	0.03	0.00	-0.03	-0.02	0.01	0.00	0.01	0.02	-0.02
18 Public social expenditure	-0.02	0.18	-0.19	0.01	-0.03	-0.11	-0.06	0.01	0.02	-0.12	0.01	0.06
19 Ethnic fractionalization	-0.09	0.00	0.01	-0.06	-0.06	0.00	0.01	-0.04	-0.01	0.02	0.02	-0.02
20 Transparency	0.00	0.20	-0.23	0.01	-0.05	-0.08	-0.07	-0.02	-0.03	-0.08	0.03	0.04
21 Income inequality	-0.08	0.06	0.01	-0.04	-0.03	-0.07	-0.01	-0.01	0.01	-0.05	0.00	0.02
22 Relative redistribution	-0.09	0.24	-0.17	-0.01	-0.03	-0.11	-0.08	-0.03	0.03	-0.15	0.01	0.06
23 Deterrence	0.07	-0.07	0.07	-0.01	0.05	0.03	0.04	0.03	0.01	0.04	-0.05	-0.02

	13	14	15	16	17	18	19	20	21	22	23
1 Tax morale											
2 Education											
3 Religious											
4 Patriotic											
5 Inequality averse											
6 Number of children											
7 Unemployed											
8 Self-employed											
9 Retired											
10 Other											
11 Income											
12 Age											
13 Gender	1.00										
14 Married	-0.07	1.00									
15 Widowed	0.17	-0.40	1.00								
16 Divorced	0.05	-0.37	-0.11	1.00							
17 Natural-born citizen	-0.02	-0.02	0.00	-0.02	1.00						
18 Public social expenditure	-0.05	-0.04	-0.07	0.05	-0.04	1.00					
19 Ethnic fractionalization	0.03	-0.01	0.04	0.01	-0.04	-0.48	1.00				
20 Transparency	-0.04	-0.05	-0.08	0.08	-0.06	0.74	-0.24	1.00			
21 Income inequality	0.02	-0.05	0.01	0.06	-0.02	0.25	-0.19	0.17	1.00		
22 Relative redistribution	-0.02	-0.07	-0.02	0.07	-0.05	0.66	-0.34	0.56	0.49	1.00	
23 Deterrence	-0.01	0.03	-0.01	-0.02	0.06	-0.01	-0.23	-0.31	0.13	-0.01	1.00

Table 9: Correlation matrix