

Voting with tax evasion: Ideological motives in tax compliance behavior

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January 31, 2019

Abstract

Based on a theoretical model in which voters' tax compliance behavior is driven by fairness concerns, we empirically analyze the channels through which ideological stances of individuals and governments impact on tax compliance behavior. Our data is from the WVS and the EVS and comprises nearly 48,000 observations from 23 OECD countries over the period 1995-2012.

Our results indicate that the consequences of a change in government ideology caused by a shift from a moderate right-wing to a moderate left-wing coalition reduces the probability to exhibit the highest tax compliance level of voters in a country with average public sector size by 1.31%. This effect is twice as large in a country whose public sector size lies 5 percent above the average.

These results highlight the importance of ideological stances in tax compliance and indicate that policy makers should focus their attention on the increasing ideological polarization recently observed in developed countries as a hurdle for reducing tax evasion and avoidance.

JEL classification: H1; H26

Key words: Tax compliance; Tax evasion; Ideological motives; Government ideology; Income redistribution; Public sector size

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*The authors declare that they have no relevant or material financial interests that relate to the research described in this work.

1 Introduction

Fighting tax evasion has become one of the cornerstones of governmental policies in developed countries after the financial crisis in 2008. This is for two reasons. First, tax evasion yields a substantial revenue loss whose reduction would allow to avoid public expenditure reductions and cuts in welfare benefits as, for instance, the ones observed in the aftermath of the financial crisis in many countries. Thus, according to the [European Commission](#), in 2009 the European Union (EU) accounted a revenue loss of € 1 trillion due to tax evasion and avoidance representing more than eight times the size of the EU annual expenditure budget (€116 billion).¹ In the United States (US), the [Internal Revenue Service](#) (IRS) reports an average annual net tax gap of \$ 406 billion over the period 2008-2010 which amounts to more than 4 times the annual cost of the healthcare program promoted by US president Barack Obama.² Second, tax evasion and avoidance impede the socially desired degree of income redistribution. Thus, [Piketty \(2015\)](#) states that, as a consequence of this, his results underestimate the increase of inequality that can be observed in most countries after 1970 and, in particular, the role of income from capital (see pp. 201, [Piketty, 2015](#)).

While it is well-understood that, on the one hand, tax evasion increases with the tax burden ([Allingham and Sandmo, 1972](#); [Slemrod, 1985](#)) and, on the other hand, citizens' opinion about the size of the public sector are embedded in 'Weltanschauungen' ([Dixit and Londregan, 1998](#)), the role of citizens' ideological stances in tax compliance has yet been completely ignored. The objective of this paper is to fill this gap in the literature and to examine the role of individual ideological positioning regarding public sector size in tax compliance. For this purpose, we first develop a simple political economy model in which individuals' tax compliance is, apart from deterrence intensity, influenced by fairness considerations. These fairness considerations comprise, on the one hand, the deviation of actual public sector size from what an individual considers the optimal size and, on the other hand, the observed levels of tax compliance in the individual's reference groups. Second, we use the insights from the theoretical model to formulate an econometric model and estimate the impact of ideological dissidence on tax compliance with individual data from the World Values Survey ([WVS](#)) and the European Values Study ([EVS](#)).

Our theoretical model allows two main conclusions. First, tax compliance decreases with the distance between individual and government ideology. Thus, right-wing voters that believe that the public sector is oversized reduce tax compliance while left-wing voters that believe that the public sector is undersized increase tax compliance. Second, as ideological stances and income are positively related, omitting ideological motives in tax compliance yields an overestimation of the income effect. From the empirical analysis we find that the consequences of a change in government ideology caused, for instance, by a shift from a moderate right-wing to a moderate left-wing coalition would reduce

¹See [Murphy \(2012\)](#), who estimates that the revenue loss due to tax evasion and tax avoidance amounts up to €860 billion and €150 billion, respectively.

²The net tax gap is calculated by the [Internal Revenue Service](#) as the gross tax gap less tax that will be subsequently collected, either paid voluntarily or as the result of IRS administrative and enforcement activities.

the probability to exhibit the highest tax compliance level of voters in a country with (5 percentage points above) average public sector size by 1.31% (2.65%). This effect is in size comparable to the impact that a shift from a middle to a high income category has on tax compliance.

These results suggest a new perspective on tax evasion. Citizens do not only evade for individual pecuniary motives but also to correct governmental public expenditure towards what they consider from their ideological perspective as the optimal level. This ‘voting with tax evasion’ gives a rather pessimistic view on the extent to which income redistribution can be effectively achieved in modern welfare states. Similar to the ‘voting with the feet’ argument from local public economics (Tiebout, 1956), citizens who consider that taxes are too high move part of their income underground or abroad. Considering current levels of tax evasion and avoidance in developed economies, it appears that the degree of income redistribution is considerably below the preferences of the median voter. The resulting discrepancy between the level of income distribution desired by a majority and the one actually observed is a source of frustration for many citizens and, therefore, is a potential source of political and social conflict. Our results indicate that more polarization in turn contributes to a reduction in tax compliance which even aggravates the problem. A deeper analysis of the motives for tax evasion and avoidance followed by policies aimed to reduce ideological polarization should therefore be upfront in the agendas of policy makers in the next years.

Our paper relates to a rather rich literature on income tax evasion and voting for redistributive taxation. Tax evasion was firstly modeled by Allingham and Sandmo (1972) as an expected utility maximization problem where the individual decision to evade depends, on the one hand, on the intensity of tax enforcement and, on the other hand, on the benefits from income under-declaration. As this model has failed to explain the observed levels of tax evasion (e.g., Alm et al., 1992), the literature has passed from considering a pure coercive relationship between governments and taxpayers to focus also on other motivations for tax compliance beyond selfishness. Firstly, it has been shown that tax compliance depends on *social norms* such as the perceived level of average tax evasion (e.g., Spicer and Hero, 1985; Porcano, 1988). Secondly, the literature has focused on the influence of *fairness* considerations for tax compliance (e.g., Bordignon, 1993; Spicer and Lundstedt, 1976; Becker et al., 1987). Specifically, it has been shown that the adequacy of public goods provision (Alm et al., 1993), perceived distributive justice (e.g., Spicer and Becker, 1980), or procedural and retributive justice (e.g., Kaplan et al., 1986; Kirchler et al., 2006) impact on taxpayers’ compliance behavior.³ In this paper, we focus on the first two of these fairness aspects and on social norms. Specifically, we formalize a model in which an individual’s utility function includes a moral cost of tax non-compliance which depends, on the one hand, on the deviation of an individual’s own amount of tax evasion from the perceived level of average tax evasion and, on the other hand, on the difference between the observed tax rate and what an individual considers as the optimal tax rate.

³See Kirchler (2007) and Wenzel (2003) for an overview of the literature. Interestingly, some authors have indicated that voting on fines and the enforcement regime can improve the perception of procedural justice and rise tax compliance (Feld and Tyran, 2002; Alm et al., 1999).

The second strand of the literature to which our paper relates is voting for redistributive taxation. Building on the work of [Romer \(1975\)](#) and [Roberts \(1977\)](#), a first political economy model of voting for redistributive taxation has been developed by [Meltzer and Richard \(1981\)](#). A basic insight from this model is that an increase in mean income relative to the median voter's income increases the size of the public sector. However, as empirical studies have failed to confirm this result (e.g., [Perotti, 1996](#); [Milanovic, 2000](#); [Karabarbounis, 2011](#)), more recent theoretical work has extended the [Meltzer and Richard \(1981\)](#) model to account for costly enforcement, personal beliefs and fairness considerations (e.g., [Alesina and Angeletos, 2005](#); [Alesina and Giuliano, 2011](#); [Bethencourt and Kunze, 2015](#); [Fehr and Schmidt, 1999](#)). Our paper relates to this literature as it includes fairness considerations within a political economy model of voting over public sector size (taxation). The main difference to previous studies is that the channel through which fairness concerns affect the median voter's preferred tax rate in this paper is the tax compliance behavior.

Finally, some recent studies have analyzed the effect of tax compliance on majority voting over income redistribution ([Roine, 2006](#); [Borck, 2009](#); [Traxler, 2012](#); [Solano-Garcia, 2017](#)). The main insights from this literature are: (i) in equilibrium, preferences for income redistribution may not be monotonic in taxpayers' income; (ii) higher tax avoidance by the median voter decreases social welfare under majority voting; and (iii) the policy implemented in equilibrium may not be the optimal policy for the median voter. The main differences from our approach to this literature are that, first, we allow for fairness concerns and social norms to account for the moral cost of tax avoidance and, second, we provide empirical evidence for the hypothesis derived from our theoretical model.

The rest of this paper is organized as follows. In [Section 2](#) we set up a theoretical model of voting over public sector size in which citizens' compliance behavior is driven by fairness concerns. In [Section 3](#) we describe the empirical strategy and discuss the estimation results. Finally, [Section 4](#) concludes.

2 Theoretical model

The objective of our theoretical model is twofold. First, we explain how ideological motives can be related to tax evasion behavior to obtain predictions on the sign of the marginal effects of the variables that are used in the empirical application. Second, as ideological motives have been so far not considered in the analysis of tax evasion or compliance behavior, we use the equilibrium analysis of our simple political economy model to uncover the relationship between ideological motives and income, the most prominent variable in explaining tax evasion. The results of this analysis are employed to set up the empirical model and to analyze the consequences of omitting ideological motives.

2.1 Framework

Consider a simple model of voting for public goods provision in which citizens' preferences over public sector size (commonly labeled as ideology) are determined by their income

and fairness considerations.⁴ The economy is inhabited by a large number of citizens or voters modelled as a continuum with mass equal to one. A citizen of type i has pre-tax income $y_i \in (0, Y]$ which is distributed according to the cumulative distribution function $F(\cdot)$ with mean $\bar{y}$ and median $y_m = F^{-1}(1/2)$, where $y_m < \bar{y}$. Denote x_i the income that is not declared, i.e., the *evaded income* by individual i , where $x_i < y_i$. Denote the unknown total amount of evaded income $X = \int_0^Y x_i dF(y_i)$ and $E[x]$ its expected mean value, which is assumed to be the same for all individuals.⁵ Citizens have preferences over consumption c_i , public goods $g_i = g$ (which are provided in the same amount to everyone), and the moral cost of tax evasion. The moral cost depends on two factors. On the one hand, it depends on social norms such as the perceived level of average tax evasion (e.g., [Porcano, 1988](#); [Solano-Garcia, 2017](#)). On the other hand, it depends on fairness considerations regarding the tax system. Thus, perceived fairness of taxation has been found to influence tax compliance behavior according to various aspects, for example, the adequacy of public goods provision ([Alm et al., 1993](#)), distributive justice (e.g., [Spicer and Becker, 1980](#)), or procedural and retributive justice (e.g., [Kaplan et al., 1986](#); [Kirchler et al., 2006](#)).⁶ Focusing on the first two of these fairness aspects and on social norms, we formalize a moral cost function that depends on the deviation of an individual's own amount of tax evasion from the perceived level of average tax evasion and on the difference between an individual's preferred size of the public sector (denoted as her 'ideology'), τ_i , and the size of the public sector implemented by the government ('government ideology'), τ . Specifically, the following quasi-linear utility function is assumed

$$u_i(c_i, g, x_i, \tau_i) = c_i + v(g) - \alpha(\tau_i - \tau)(x_i - E[x]) \quad (1)$$

with $v'(\cdot) > 0$, $v''(\cdot) < 0$, $\lim_{g \rightarrow 0} v'(g) \rightarrow \infty$, $\lim_{g \rightarrow \infty} v'(g) \rightarrow 0$, $\epsilon_{v',g} \equiv -v''g/v' \leq 1$, and $0 \leq \alpha \leq 1$. As it turns out, the cost is positive for individuals that evade more than the average and consider that the public sector is undersized, and for individuals that evade less than the average and consider that the public sector is oversized. By contrast, individuals that evade more than the average and consider that the public sector is oversized (e.g., right-wing voters in countries with high government spending levels) find a moral justification for their evasion behavior. The same occurs for citizens that evade less than the average when they consider that the size of the public sector is inefficiently small.⁷ Finally, notice that taxpayers face no moral cost if the implemented public sector size coincides with their preferred public sector size.⁸

⁴For similar models see, e.g., [Bordignon \(1993\)](#), [Myles and Naylor \(1996\)](#) and [Solano-Garcia \(2017\)](#). See also [Corneo and Grüner \(2002\)](#) and [Alesina et al. \(2012\)](#) for a general discussion of the relationship between ideology, income and redistribution.

⁵Notice that allowing for idiosyncratic beliefs would make the model less tractable without changing its basic insights.

⁶See [Kirchler \(2007\)](#) and [Wenzel \(2003\)](#) for an overview of the literature.

⁷See also [Solano-Garcia \(2017\)](#) for a related assumption on the moral cost of tax evasion. Differently to our model he does not consider the difference between preferred and observed tax rates. Furthermore, in this specification it is assumed that individuals suffer equally by evading more as well as by evading less than what they expect from the average taxpayer.

⁸While this seems to be a strong assumption it should be noticed that, as can be observed in [Section 2.4](#), this holds only for the median voter, i.e., for a mass of voters of zero.

The government levies a proportional tax $t \in [0, 1)$ on declared income. Taxpayers are audited with probability $p \in [0, 1]$ by governmental tax agencies (in which case tax evasion will be discovered with probability one) and punished with the fine $\lambda x_i^2/2y_i$.⁹ Denoting $\theta = p\lambda$ as the intensity of tax enforcement, we can write the expected penalty π as $\pi(x_i; y_i, \theta) \equiv \pi(x_i) = \theta x_i^2/2y_i$.¹⁰ We assume that the intensity of tax enforcement is bounded from below and from above. Specifically, we assume that $t < \theta < 1$.¹¹ Moreover, we assume that the cost of tax enforcement is totally covered by the fines that are levied.¹²

Tax revenues are returned to citizens via transfers or public goods and services. The shadow price of public funding is given by $1 - \delta$ such that, as the government's objective is purely redistributive, the proportion $\delta \in (0, 1]$ of tax revenues is returned to citizens. Furthermore, the government budget is assumed to be balanced. Consequently, citizen i expects to receive the following amount of per capita public goods provision from the government

$$g = \delta t (\bar{y} - E[x]) \quad (2)$$

Citizens are risk neutral and consume their whole after-tax income such that

$$c_i = (1 - t) y_i + t x_i - \pi(x_i). \quad (3)$$

Therefore, after substituting (2) and (3) into (1), citizen i 's expected indirect utility function can be written as

$$u_i(x_i, y_i, \tau_i; t, \tau, \omega) = (1 - t) y_i + t x_i - \pi(x_i) + v(\delta t (\bar{y} - E[x])) - \alpha (\tau_i - \tau) (x_i - E[x]) \quad (4)$$

where $\omega = (\alpha, \delta, \theta, \bar{y})$.

The timing of the game is as follows. In stage 1, political parties announce their political platforms consisting of an income redistribution policy implemented via the tax rate t . In stage 2, elections take place where citizens vote for a tax policy according to their preferences for taxation. The winner implements his proposed tax rate after the elections. In stage 3, taxpayers decide their level of tax compliance according to the observed tax rate, their preferences for taxation and their expected level of general tax compliance. The game is solved by backward induction.

⁹The assumption of an expected marginal penalty which is decreasing in income can be justified by the fact that fines also increase with the share of evaded income. This means that for the same amount of evaded income the fine will be lower for an individual with larger income. Other explanations are that high income owners have more possibilities for legal tax avoidance or that the probability of detecting tax evasion decreases with income. In both cases the expected marginal penalty would also decrease with income.

¹⁰The assumption of this specific functional form is to simplify the exposition of the results. The main results of this paper will also hold if a more general functional form is assumed that fulfills $\pi'(\cdot) > 0$, $\pi''(\cdot) > 0$, $\partial \pi'(\cdot)/\partial \theta > 0$, $\partial \pi'(\cdot)/\partial y_i < 0$, $\pi(0) = 0$, $\pi'(0) = 0$, $\pi(y_i) < y_i$, and $\pi'(y_i) < 1$.

¹¹For a similar assumption, see (e.g., Allingham and Sandmo, 1972; Slemrod, 1985).

¹²If the tax agency's budget (say B) is pre-assigned, this assumption implies that the budget constraint of the tax agency is balanced, i.e., $E\pi(x) = B$. With perfectly rational individuals this implies that the auditing probability p will depend on B and the taxpayers' expectations about tax evasion. In a more general model, the budget B (and with it p) could also be subjected to voting such that t and p would be endogenous (see, e.g., Solano-Garcia (2017) for an analysis of this type).

2.2 Tax evasion

Given the tax rate, the enforcement level and expected tax evasion, at stage 3 of the game, citizens decide their optimal level of tax evasion by maximizing (4) with respect to x_i . This yields the optimal level of tax evasion

$$x_i^* = x(y_i, \tau_i; t, \tau, \omega) = \begin{cases} \frac{t - \alpha(\tau_i - \tau)}{\theta} y_i & \text{for } t - \alpha(\tau_i - \tau) < \theta \\ y_i & \text{else} \end{cases}. \quad (5)$$

Studying the comparative statics of (5), we obtain the following result:

Proposition 1. *The evaded income increases with the level of taxation and income, and decreases with the intensity of tax enforcement and the distance between individual and government ideology.*

This result is common to models of tax evasion and in accordance with empirical evidence. Thus, the evaded income increases with the tax rate and income, and decreases with the intensity of tax enforcement (e.g., Allingham and Sandmo, 1972; Slemrod, 1985).¹³ Moreover, the moral cost of tax evasion yields tax evasion to rise (decline) when the observed tax rate lies above (below) what is considered as the optimal level of taxation. Analyzing the implication of this optimal tax evasion behavior for the provision of public goods, we can state the following result:

Proposition 2. *Public goods provision follows a Laffer curve, where $\partial^2 g / \partial t^2 > 0$, $\lim_{t \rightarrow 0} g(t) = \lim_{t \rightarrow 1} g(t) = 0$, $\lim_{t \rightarrow 0} g'(t) = \infty$, and $\lim_{t \rightarrow 1} g'(t) = -\infty$.*

2.3 Ideology and public sector size

Next, to solve stage 2 of the game, consider citizens' ideological stances regarding public sector size. For simplicity let us assume that there is no debt nor government deficit or surplus such that public sector size and average taxation coincide, i.e., $t = \tau$.¹⁴ Furthermore, let us suppose that individuals form their ideological positioning on what is the optimal public sector size (τ_i^*) from the maximization of individual welfare. Then, after substituting the optimal level of tax evasion x_i^* into (5), the individual's expected indirect utility function at $\tau = \tau_i$ becomes

$$u_i(y_i, \tau_i; \omega) = (1 - \tau_i) y_i + \frac{y_i}{2\theta} \tau_i^2 + v(g(\tau_i)). \quad (6)$$

Expression (6) underlines some important features that shape individual's preferences regarding optimal taxation (public sector size). The first term is decreasing in the tax rate as higher taxation reduces an individual's net income. The second term is the difference between evaded tax payments and the expected penalties and is increasing in the tax

¹³Notice, however, that in more general theoretical models the relationship between income tax evasion and the tax rate depends on the degree of risk aversion and the way in which fines are imposed (Allingham and Sandmo (1972) and Yitzhaki (1974)).

¹⁴Notice, however, that the empirical part of this paper is not based on this assumption.

rate because, with optimal evasion behavior, the benefits from tax evasion dominate the expected costs. Finally, the third term denotes an individual's utility from public goods provision which, as observed in Proposition 2, is inversely U-shaped in the tax rate. From maximization of the utility function in (6) with respect to τ_i we obtain, as the stage-2 equilibrium values, citizen i 's preferred level of taxation, $\tau_i^* = \tau(y_i, \omega)$.

Proposition 3. *Citizens' desired tax rate or public sector size (ideology): i) lies strictly between zero and one ($0 < \tau_i^* < 1$); ii) decreases with income, i.e., richer citizens prefer less public spending ($\partial \tau_i^* / \partial y_i < 0$); iii) increases/decreases with mean income for rich/poor citizens ($\partial \tau_i^* / \partial \bar{y} > 0 / \partial \tau_i^* / \partial \bar{y} < 0$); iv) increases/decreases with the moral cost parameter for rich/poor citizens ($\partial \tau_i^* / \partial \alpha > 0 / \partial \tau_i^* / \partial \alpha < 0$); v) increases with the efficiency of the public sector ($\partial \tau_i^* / \partial \delta > 0$); and vi) increases with the intensity of tax enforcement ($\partial \tau_i^* / \partial \theta > 0$).*

The first result is non-surprising as the provision of public goods follows a Laffer curve. Therefore, the rich prefer a strictly positive tax rate to guarantee a minimum amount of public good provision from which they derive a large marginal utility. On the other hand, the poor prefer a tax rate below one, as they anticipate that, due to increased tax evasion, an increase in the tax rate will not yield more public good provision. The second result indicating that citizens' preferred public sector size decreases with income is common in the literature (Persson and Tabellini, 2002). The driving force behind this result is that the marginal utility of an increase in taxation decreases with income, i.e., poor citizens benefit more from a rise in the tax rate than rich citizens. The third result seems to be surprising at first sight. However, to understand it, consider that poor citizens prefer a large public sector. Therefore, at their preferred tax rate we are at the downward sloping part of the Laffer curve. Consequently, an increase in mean income (because of tax evasion) will decrease public revenues. Thus, to raise tax revenues it becomes optimal to decrease taxation. For rich citizens the effect goes into the opposite direction which explains the third result. The importance of moral concerns in tax evasion has a positive impact on the preferred tax rate by rich citizens. This is because with larger values of α they will evade more, and, thus contribute less to financing public spending from which, however, they benefit through the consumption of public goods. By contrast, for poor citizens a larger moral cost will decrease their tax evasion and consequently, they benefit less from public spending and prefer a smaller public sector. Regarding the last two results, as expected, we observe that citizens prefer a larger public sector when it is more efficient and when tax enforcement is more intense.

2.4 Political competition

Now, at stage 1 of the game, consider the political equilibrium in this model of income tax evasion to determine the tax policy proposed by parties at equilibrium. As is common in the literature, we assume that the government is formed by the winner of a two-party electoral process (Persson and Tabellini, 2002). Parties compete under the majority rule and announce simultaneously their platforms. Platforms are unidimensional and consist of a public spending policy implemented with a proposed tax rate. Parties merely derive utility from winning the election where their utility equals their winning probability. Thus,

under the majority rule their utility is one (zero) if they obtain more (less) than half of the votes. In case of a tie their utility is 1/2. Voters vote for the platform that gives them highest utility. The winning party implements its announced policy. Parties have perfect information about citizens' ideology (preferences on public spending or income taxation). Consequently, they also can anticipate citizens' tax evasion behavior.

To derive the tax rate proposed by parties at equilibrium, from Proposition 2 we know that citizens' optimal tax rates are strictly decreasing in income, i.e., richer citizens prefer lower tax rates. Consequently, the monotonicity of preferences assures that the median voter theorem can be applied and that the pivotal citizen is the one with median income. Thus, the stage-1 equilibrium tax rate that wins majority voting and that will be implemented by the government is given by $\tau = \tau_m^* = \tau(y_m, \omega)$.

The effect of an increase in income inequality, captured by an increase in mean income compared to median voter's income, on the size of the public sector has been a central issue since the seminal paper by Meltzer and Richard (1981). In their paper they find a positive relationship that, however, has not been confirmed by empirical evidence (e.g., Karabarbounis, 2011). From Proposition 3 follows that the effect of a rise in mean income on the median citizen's preferred tax rate is ambiguous. Generally, it will depend on how close the median voter's income is to the income of the poor (i.e., on the income distribution) and on the level of taxation. Thus, with an extremely left-skewed income distribution or with strong moral concerns, high government effectiveness and intensive tax enforcement it is more likely that an increase in mean income yields a decrease in taxation. By contrast, the Meltzer and Richard (1981) result that public sector size increases with mean income in our model is obtained when the opposite conditions hold. Considering, for instance, that government efficiency should be expected to be a decreasing function of public sector size, this result also gives an explanation for the empirical observation that public sector size is not monotonically increasing with mean income (Karabarbounis, 2011).

With regard to tax evasion, substituting τ_i^* and τ_m^* into (5) allows to write the stage-1 equilibrium level of tax evasion as $x_i^* = x(y_i, y_m, \omega)$. Regarding the marginal effects of the explanatory variables, we obtain the following result:

Proposition 4. *Citizens' tax evasion: i) increases with income ($\partial x_i^* / \partial y_i > 0$); and ii) decreases with the income of the median voter ($\partial x_i^* / \partial y_m < 0$).*

These results follow directly from the fact that tax evasion decreases in t_i and increases in t_m , and that tax rates decrease in income (see Proposition 3).

3 Empirical approach

In this section, we propose an empirical application to test the validity of the theoretical predictions and to assess the magnitude of possible impacts of ideology on tax compliance. The organization of this section is as follows. We first describe the data and formulate the hypothesis subject to empirical testing. We then specify the empirical model and discuss the estimation results.

3.1 Data

Our individual-level data is from the World Values Survey (WVS) and European Values Survey (EVS). These surveys contain representative questionnaire data from face-to-face interviews conducted by professional scientific institutions at the respondents' home. In this study we make use of the combined WVS/EVS data file which, for the variables of interest, leaves us with nearly 48,000 observations between 1995 and 2012 for 23 OECD countries: Australia (AUS), Austria (AUT), Belgium (BEL), Canada (CAN), Denmark (DEN), Finland (FIN), France (FRA), Germany (GER), Greece (GRE), Iceland (ICE), Ireland (IRE), Italy (ITA), Japan (JAP), Luxembourg (LUX), the Netherlands (NED), New Zealand (NZL), Norway (NOR), Spain (SPA), Sweden (SWE), Switzerland (SWI), Turkey (TUR), the United Kingdom (UK) and the US.¹⁵ Furthermore, for some of our explanatory variable we make use of country-level data. Details on variable definitions, data sources and the descriptive statistics of our variables can be found in Tables 2, 3 and 4 in the Supplementary Material to this paper.

3.1.1 Dependent variable: Tax compliance

Our dependent variable is *Tax compliance*. We use the following question from the WVS/EVS: *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'*. The respondents' answers are on a ten-point scale ranging from 1 (never justify) to 10 (always). As is common in the literature, the answers were recoded into a four-point scale using the following criterion: responses from 7 to 10 were combined into a value 0 (lowest level of tax compliance), responses 4, 5 and 6 were recoded as 1; responses 2 and 3 recoded as 2; and 1 is recoded as 3 (the highest level of tax compliance). Alternatively, we also use the original ten-point scale to test the robustness of our categorization.¹⁶

The advantage of this measurement of the dependent variable is that it allows us to obtain cross-country comparable data for a large set of countries over a period of 18 years.¹⁷ Another advantage is that tax compliance comprises both tax evasion and tax avoidance behavior which are both core to ideological motives. Nevertheless, it should be noticed that in developed countries, as shown for instance by Richardson (2006) and Torgler et al. (2008), actual tax evasion and voluntary tax compliance are strongly negative correlated.¹⁸

¹⁵As tax evasion behavior and fairness perceptions are substantially different in Eastern European countries, these were not included into the analysis. For details on the number of observation per country and the year in which they have been taken see Table 10 in the Supplementary Material to this paper.

¹⁶See Figures 1 and 2 in the Supplementary Material to this paper for the distribution of the dependent variable on a four-point scale and on the original ten-point scale, respectively.

¹⁷A cross-country comprehensive data base for this variable is not available as tax evasion behavior is rather difficult to measure and existing information in many countries is not publicly revealed (Andreoni et al., 1998).

¹⁸See also Elffers et al. (1987) and Frey and Torgler (2007) for an extensive discussion on the bias of self-reported tax evasion measures.

3.1.2 Explanatory variables

Income. The variable *Income* is measured on a ten-point scale: *Lower step* (1), *Second step* (2), *Third step* (3), *Fourth step* (4), *Fifth step* (5), *Sixth step* (6), *Seventh step* (7), *Eighth step* (8), *Ninth step* (9), *Tenth step* (10), where respondents to the WVS/EVS classify themselves into these income scales by answering the following question: ‘*Here is a scale of incomes and we would like to know in what group your family is, counting all wages, salaries, pensions, and other income that comes in. Just give me the number of the group your household falls into before tax and other deductions*’. The income groups are constructed with information from country-specific income distributions. From the theoretical model we expect a negative influence of *Income* on *Tax compliance*.

Ideological distance. To measure the ideological distance between individuals and their government, i.e., $\tau_i - \tau$, we define two variables: *Ideology* and *Government ideology*. The variable *Ideology* is constructed on the basis of the following WVS/EVS question: ‘*In political matters, people talk of ‘the left’ and ‘the right’. How would you place your views on this scale generally speaking?*’. The respondents’ answers to this question are ranked on a ten-point scale, from 1 (extreme leftist) to 10 (extreme rightist).¹⁹ Consequently, as right-wing (left-wing) voters typically advocate for a small (large) public sector, *Ideology* has the opposite sign to τ_i . *Government ideology* is from the Parliaments and Governments Database (ParlGov) by Döring and Manow (2017). This database contains information on parties’ ideological positioning (their platform) on a 0 (leftist)-10 (rightist) scale such that this variable is also negatively related to τ . Moreover, it includes data on the composition of Parliaments and government coalitions. Our variable *Ideological distance* is the difference between the respondents’ ideology (*Ideology*) and the ideology of the government in office (*Government ideology*) which, in case of multi-party governments, is measured as the unweighted mean of coalition parties’ ideology.²⁰ To test the robustness of our results, two alternative measures are employed. First, *Weighted ideological distance* calculates *Government ideology* as the weighted mean of coalition parties’ ideology using the seats in Parliament for the construction of weights. Secondly, *Ideological distance to prime minister* is the difference between the respondents’ ideology and the ideology of the party of the prime minister. From the above consideration follows that *Ideological distance*, *Weighted ideological distance*, and *Ideological distance to prime minister* $\in [-10, 10]$, where a positive (negative) value indicates that the respondent is more rightist (leftist) than the government or prime minister.

While in the theoretical model ideological distance refers to the difference between the actual and preferred public sector size (or taxation), our empirical variable measures discrepancy with governmental policies in a broader sense, as for instance, regarding the distribution of the public budget over different spending categories. As such a dissidence might also affect taxpayers’ willingness to comply, we consider this measurement of the ideological distance variable even more advantageous for the purpose of the empirical

¹⁹The distribution of *Ideology* is displayed in Figure 3 in the Supplementary Material to this paper.

²⁰In election years, we consider the ideology of the government that has been the main part of the year in office.

analysis.²¹ From the results in Proposition 1 we expect a negative impact of *Ideological distance* on *Tax compliance*.

Tax revenue. The variable *Tax revenue* (as a proxy for t) is measured by total tax revenue as a share of Gross Domestic Product (GDP) from OECD (2018). The variable is measure in percentage points with *Tax revenue* $\in [23.06, 48.80]$. From the theoretical model we expect that the probability to exhibit highest *Tax compliance* decreases with *Tax revenue*.

Public sector size. The variable *Public sector size* is measured by total general government expenditure as a share of Gross Domestic Product (GDP) from OECD (2018). The variable is measured in percentage points and, to simplify the interpretation of our results, centered around its mean 44.26 such that *Public sector size* $\in [-12.35, 18.05]$. We use *Public sector size* as an interaction variable with *Ideological distance* to allow for distinguished level effects in the latter variable.

Government effectiveness. The efficiency of the public sector (as a proxy for δ) is measured with *Government effectiveness* as defined by World Bank Governance Indicators. It is measured on a scale that ranges from -2.5 (weak) to 2.5 (strong) government performance. From our theoretical results we expect a negative impact on the probability to exhibit highest *Tax compliance* (see Proposition 4).

Economic controls. As further country-specific economic variables we use *Inflation* and *Unemployment*. Both variables are measured in percentage points.

Socio-demographic controls. As is common in the literature that uses data from the WVS/EVS, we include in our analysis a number of variables to account for the respondents' socio-demographic characteristics such as age, gender, educational level, occupational status and marital status. Furthermore, to account for personal and social norms, we define two dichotomous variables indicating religious beliefs and patriotism, respectively.²² Finally, we include fixed effects to account for time invariant institutional and idiosyncratic differences across countries that are not captured by the aforementioned country-specific variables.

²¹Notice also, that there are two questions in the WVS/EVS that are closely related to our analysis: "Extensive welfare versus lower taxes" and "Importance of eliminating big income inequalities". However, the use of this data would reduce our sample size by more than 75%. Therefore, we have not considered this data.

²²The choice of the control variables is motivated by two criteria. Firstly, we have used those variables that have been commonly found to have an influence on tax compliance behavior. Secondly, we have included those variables that are commonly available for all waves and countries. A more detailed description of the definition and measurement of these variables is in Table 2.

3.1.3 Hypothesis

With this measurement of our dependent and explanatory variables at hand and noticing that tax evasion and tax compliance are inversely related, Proposition 4 indicates a negative relationship between tax compliance and income. However, Proposition 1 and Proposition 3 reveal that part of this influence stems from ideological motivations. The objective of the empirical application, therefore, is to test the following hypothesis:

Hypothesis 1: The influence of income on tax compliance is partly channeled through ideological distance to the government whereby *Tax compliance* decreases with *Ideological distance*.

3.2 Empirical model

We employ an ordered probit regression model to account for the categorical character of our dependent variable *Tax compliance*. The model contains country and time dummies to account for unobservable country and time-specific effects with the US and 1995 as the reference country and year, respectively. Specifically, the estimation model is:

$$y_{i,c}^* = \beta' \mathbf{x}_{i,c} + \gamma' \mathbf{z}_{i,c} + \eta_j + \rho_t + \nu_c + \varepsilon_{i,c} \quad (7)$$

where y^* is a latent variable (tax compliance of individual i in country c), $\mathbf{x}$ is a vector of main explanatory variables, $\mathbf{z}$ is a vector of control variables, η_j is a vector of intercepts for each tax compliance category (*Middle low*, *Middle high* and *High* as compared to the base category *Low*), and ρ_t and ν_c are vectors of time and country dummies, respectively. 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:

$$P(y_{i,c}^* = j) = F(\alpha_{j+1} - \beta' \mathbf{x}_{i,c} - \gamma' \mathbf{z}_{i,c} - \eta_j - \rho_t - \nu_c) - F(\alpha_j - \beta' \mathbf{x}_{i,c} - \gamma' \mathbf{z}_{i,c} - \eta_j - \rho_t - \nu_c)$$

where F denotes the standard normal cumulative distribution function. The four categories for our tax compliance variable y^* are: low ($j = 0$), medium low ($j = 1$), medium high ($j = 2$), and high ($j = 3$). The vector of control variables $\mathbf{z}$ includes: *Age*, a gender dummy (*Female*), a dummy for religious beliefs (*Religious*), a dummy for patriotism (*Patriotic*), two educational level dummies (*Medium* and *High*), four occupational status dummies (*Unemployed*, *Self-employed*, *Retired*, *Other*), three marital status dummies (*Married*, *Divorced* and *Widowed*) and, as economic controls, *Inflation* and *Unemployment*.

To test our hypothesis we use three different specifications. In Specification I, the vector of explanatory variables $\mathbf{x}$ includes *Income*, *Tax revenue*, *Ideological distance*, the interaction *Ideological distance* $\times$ *Public sector size* and *Government effectiveness*. In Specification II, the direct and indirect effect of *Income* on *Tax compliance* are estimated together such that $\mathbf{x}$ does not comprise *Ideological distance* and its interaction with *Public sector size* (see Proposition 4). Finally, Specification III is used to confirm that, as predicted by Proposition 3, *Ideology* is effectively determined by *Income*.

3.3 Results

3.3.1 Basic model

The estimation results are displayed in Table 1. Due to the non-linearity of the ordered probit regression model, the coefficient estimates of Specifications I, II and III in columns 1, 3 and 5, respectively, cannot be interpreted directly. Therefore, to obtain an impression of the quantitative impact of the variables, we also provide the marginal effects for the probability to exhibit the highest compliance level (i.e., *Tax compliance = High*) in columns 2 and 4. Similarly, the marginal effects for the highest ideology level (i.e., *Ideology = 10*) is displayed in column 6. The reported p-values are clustered by country to avoid an underestimation because of intra-group error correlation. The discussion is limited to estimates with a p-value below 5 percent.

The results in Table 1 allow us to assess the validity of Hypothesis 1. Considering countries of average public sector size (i.e., *Public sector size = 0*) we observe, as predicted, that the probability for a taxpayer to exhibit the highest tax compliance level decreases significantly with *Ideological distance*. From the marginal effects in column 2 we obtain that this probability is by 1.31% lower for a moderate rightist (e.g., with *Ideology = 7*) when compared to a moderate leftist (*Ideology = 3*). Similarly, the consequences of a change in government ideology caused, for instance, by a shift from a moderate right-wing to a moderate left-wing coalition would reduce the probability to exhibit the highest tax compliance level of voters by the same amount. This effect is in size comparable to a shift from a middle to a high income category (e.g., from 6 to 10).

From the estimates of the interaction term, we observe that for countries with a public sector above the average this effect would be even larger. For example, in a country that lies 5 percentage points above the average the probability is by 2.65% lower for a moderate rightist when compared to her leftist counterpart. By contrast, in countries 5 percentage points below the average, the difference in the impact of ideological distance to the government on tax compliance between moderate leftists and rightists vanishes completely. Taken together, these results indicate that both the ideological distance to the government and the size of the public sector significantly and sizeably influence tax compliance behavior in developed economies leading us to confirm the predictions in Hypothesis 1 regarding the impact of ideological distance on tax compliance.

The remaining results in Specification I regarding *Income*, *Tax revenue* and *Government effectiveness* have expected negative effects on tax compliance behavior. The parameter estimate of *Inflation* turns out to be negative while that of *Unemployment* is positive. With regard to the socioeconomic control variables, the results obtained are in line with previous empirical studies based on the WVS/EVS. Thus, elderly people, women, and religious or patriotic individuals exhibit higher levels of voluntary tax compliance. The marginal effects for the latter three variables with respect to their reference categories are 7.34%, 5.38% and 6.07%, respectively. The educational level turns out to have no significant impact on tax compliance.²³ By contrast, the employment and marital

²³However, see Rodriguez-Justicia and Theilen (2018) for the role of education as an indirect channel in shaping individuals' tax compliance.

	(I) Tax compliance		(II) Tax compliance		(III) Ideology	
	oprobit	ME	oprobit	ME	oprobit	ME
Income	-0.010*** (0.002)	-0.355	-0.011*** (0.000)	-0.397	0.027*** (0.000)	0.199
Tax revenue	-0.013** (0.035)	-0.455	-0.014*** (0.002)	-0.506		
Ideological distance	-0.009** (0.025)	-0.328				
x Public sector size	-0.002*** (0.002)	-0.067				
Government effectiveness	-0.216*** (0.001)	-7.647	-0.166*** (0.010)	-5.894		
Inflation	-0.040*** (0.000)	-1.402	-0.031*** (0.000)	-1.089		
Unemployment	0.012*** (0.003)	0.414	0.005 (0.240)	0.169		
Age	0.009*** (0.000)	0.327	0.009*** (0.000)	0.326	0.003** (0.015)	0.023
Female (Ref.: Male)	0.206*** (0.000)	7.335	0.207*** (0.000)	7.389	-0.099*** (0.000)	-0.743
Religious (Ref.: Non religious)	0.150*** (0.000)	5.375	0.145*** (0.000)	5.183	0.295*** (0.000)	2.084
Patriotic (Ref.: Non patriotic)	0.168*** (0.000)	6.068	0.162*** (0.000)	5.823	0.339*** (0.000)	2.001
Educational level (Ref.: Low)						
Medium	0.001 (0.941)	0.049	0.000 (0.985)	0.012	-0.020 (0.696)	-0.163
High	0.031 (0.213)	1.094	0.031 (0.217)	1.107	-0.124* (0.095)	-0.907
Occupational status (Ref.: Employed)						
Unemployed	-0.063* (0.073)	-2.248	-0.059* (0.080)	-2.125	-0.034 (0.213)	-0.240
Self employed	-0.102*** (0.003)	-3.677	-0.107*** (0.002)	-3.862	0.132*** (0.000)	1.071
Retired	0.072*** (0.004)	2.532	0.070*** (0.005)	2.467	0.008 (0.770)	0.058
Other	0.036* (0.052)	1.294	0.035* (0.061)	1.231	0.084*** (0.000)	0.652
Marital status (Ref.: Never married)						
Married / living together	0.085*** (0.000)	3.020	0.085*** (0.000)	3.032	0.061* (0.056)	0.445
Divorced / separated	-0.052** (0.026)	-1.876	-0.050** (0.029)	-1.815	-0.022 (0.391)	-0.151
Widowed	0.060* (0.096)	2.137	0.058 (0.110)	2.065	0.102*** (0.000)	0.777
Constant cut1	-1.885*** (0.000)		-1.879*** (0.000)		-1.290*** (0.000)	
Constant cut2	-1.168*** (0.000)		-1.164*** (0.000)		-0.924*** (0.000)	
Constant cut3	-0.475* (0.065)		-0.470** (0.012)		-0.366*** (0.005)	
Constant cut4					0.029 (0.817)	
Constant cut5					0.809*** (0.000)	
Constant cut6					1.240*** (0.000)	
Constant cut7					1.651*** (0.000)	
Constant cut8					2.180*** (0.000)	
Constant cut9					2.507*** (0.000)	
Observations	47,772		47,772		47,772	
Pseudo R-squared	0.0532		0.0527		0.0200	

Table 1: Estimation results. Ordered probit with clustered standard errors by country (23 clusters). All estimations include country and time fixed effects. Marginal effects (ME) in percentage points. Robust p-values in parentheses where ***, ** and * indicate $p < 0.01$, $p < 0.05$ and $p < 0.1$, respectively.

status have a significant influence on tax compliance with positive effects for retired and married individuals and negative effects for self-employed and divorced individuals with respect to their base categories (Employed and Never married, respectively).

In Specification II, *Ideological distance* is taken out from the model. As a consequence, the marginal effect of a shift from a middle to a high income category (e.g., from 6 to 10) on the probability that a taxpayer exhibits the highest level of tax compliance decreases from -1.42% to -1.59%. This reinforcement of the negative effect of income on tax compliance is in accordance with the results in Proposition 3 which predicts a negative impact of *Ideology* on *Tax compliance* which is also empirically confirmed in Specification III. In column 5 we observe that the parameter estimate of *Income* has a significantly positive influence on *Ideology*. However, in explaining ideological stances the marginal effects displayed in column 6 also reveal that the influence of other variables such as gender or religion is even higher than that of income. Acknowledging that ideological stances surely cannot be completely explained by our explanatory variables, our results emphasize the importance of including ideological motives in the analysis of tax compliance behavior.

3.3.2 Robustness checks

Several robustness checks are indicated whose results are displayed in the Supplementary Material to this paper. First, we check whether our results are sensitive to the categorization of the dependent variable. For this purpose we perform alternative estimations with the original 10 point scale. The results in Table 5 indicate that this alternative categorization does not imply substantial changes.

Second, we use the generalized linear model (GLM) as an alternative estimation method and rescale our dependent variable from the original ten-point scale to take values between 0 and 1. The estimates in Table 6 are similar in terms of sign and significance to those in Table 1 and indicate that this alternative estimation procedure does not modify our conclusions regarding the impact of *Ideological distance* on tax compliance.

Third, to test the sensitivity of the above results regarding the measurement of the ideological distance to the governmental coalition, in Table 7 *Ideological distance* (in Specification I) is replaced by *Weighted ideological distance* (in Specification II) and by *Ideological distance to prime minister* (in Specification III), respectively. We find that these alternative forms of measuring government ideology have negligible effects on the results commented on above.

Finally, to exclude that the results are driven by outliers, the model in (7) is estimated by excluding the countries with the most left and right-skewed distribution of tax compliance. As observed in Figure 4, these countries are Belgium, Greece, Japan, Luxembourg, Norway and Turkey. The results in Table 8 indicate that despite the loss of around 9,000 observations and a drop in the significance level of non-interacted *Ideological distance* the sign and impact of our main variables remain unchanged.

4 Conclusions

In this paper we analyze the importance of ideological stances for tax compliance behavior. Our theoretical and empirical results confirm that, indeed, ideology has a considerable

influence on tax compliance. Thus, citizens use tax evasion to correct for undesired levels and ways of governmental spending. This ‘voting with tax evasion’ give a rather pessimistic view on the extent to which income redistribution can be effectively achieved in modern welfare states and hints as political polarization as an important hurdle to it. Therefore, as ideological stances are not completely exogenous (see [Alesina et al. \(2012\)](#)), policy makers concerned about increasing income inequality should promote policies that allow to reduce ideological polarization.

While in this paper we have focused on the impact of ideological stances on tax compliance, future research should analyze its impact on effective tax evasion and avoidance, and deepen our understanding of the relationship between political polarization, tax compliance and public spending policies.

Acknowledgements

Financial support from the Spanish *Ministerio de Economía, Industria y Competitividad* and the European Union under project ECO2016-75410-P (AEI/FEDER, UE) is gratefully acknowledged. We thank Susana Iranzo Sancho, Carolina Manzano Tovar, Raffaele Fiocco, Marko Crnogorac and the participants of the 6th Annual TARC Congress at Exeter, the XXV Encuentro de Economía Pública at Valencia and of the 6th WIPE Workshop at Reus for helpful comments and suggestions.

Appendix

4.1 Proof of Proposition 2

From expression (5) follows that expected evasion is given by

$$E[x; t] = \frac{t\bar{y} + \alpha\tau\bar{y} - \alpha E[\tau_i y_i]}{\theta}. \quad (8)$$

Thus, the first and second-order derivatives of $g(t) = \delta t (\bar{y} - E[x; t])$ with respect to t are

$$g'(t) = \delta (\bar{y} - E[x; t]) - \frac{\delta \bar{y}}{\theta} t, \text{ and } g''(t) = -\frac{2\delta}{\theta} \bar{y} < 0.$$

Furthermore, since $t \leq \theta \leq 1$, for $t = 1$ we have $\theta = 1$ such that $x_i = y_i$ and $E[x; 1] = \bar{y}$. Accordingly, $g(0) = g(1) = 0$, $g'(0) = \delta \bar{y} > 0$ and $g'(1) = -\delta \bar{y} / \theta < 0$.

Finally, it can be observed that the tax-elasticity of public good provision is less than unity

$$\epsilon_{g,t} \equiv \frac{g'}{g} t = 1 - \frac{t\bar{y}}{\theta (\bar{y} - E[x; t])} < 1. \quad (9)$$

4.2 Proof of Proposition 3

The first-order condition from maximizing (6) with respect to τ_i is

$$u'(\tau_i^*) = -y_i + \frac{y_i}{\theta} \tau_i^* + v'(g(\tau_i^*)) g'(\tau_i^*) = 0. \quad (10)$$

Using the fact that $\lim_{\tau_i \rightarrow 0} g(\tau_i) = \lim_{\tau_i \rightarrow 1} g(\tau_i) = 0$, existence of an interior solution for $\forall i$ is guaranteed by

$$\lim_{\tau_i \rightarrow 0} u'(\tau_i) = -y_i + \delta \bar{y} v'(0) = \infty > 0, \text{ and } \lim_{\tau_i \rightarrow 1} u'(\tau_i) = -\frac{\delta(1+\alpha)\bar{y}}{\theta} v'(0) = -\infty < 0,$$

which proves the first statement. Moreover, from (10) follows that $\lim_{y_i \rightarrow 0} u'(\tau_i^*)$ implies $g'(\tau_i^*) = 0$ and $\lim_{y_i \rightarrow \infty} u'(\tau_i^*)$ implies $v'(g(\tau_i^*)) = \infty$. Thus,

$$\lim_{y_i \rightarrow 0} \tau_i^* = \frac{\theta \bar{y} + \alpha E[\tau_i y_i]}{2(1+\alpha)\bar{y}} \equiv \bar{\tau} \text{ and } \lim_{y_i \rightarrow \infty} \tau_i^* = 0.$$

Next, noticing that $u''(\tau_i^*) < 0$, from implicit differentiation of (10) we obtain

$$\frac{dt_i^*}{dy_i} = \frac{\theta - \tau_i^*}{\theta u''(\tau_i^*)} < 0, \quad (11)$$

which proves the second statement.

To prove statement *iii*), from implicit differentiation of (10) we obtain

$$\begin{aligned} \frac{dt_i^*}{d\bar{y}} &= -\frac{v''(g(\tau_i^*)) g'(\tau_i^*) \frac{\partial g}{\partial \bar{y}} + v'(g(\tau_i^*)) \frac{\partial g'}{\partial \bar{y}}}{u''(\tau_i^*)} \\ &= \delta \frac{(1 - \epsilon_{v',g} \epsilon_{g,\tau}) [(1+\alpha) \tau_i^* - \theta] + (1+\alpha) \tau_i^*}{\theta u''(\tau_i^*)} v'(g(\tau_i^*)). \end{aligned} \quad (12)$$

Thus, from our assumption regarding v' and (9) we obtain

$$\begin{aligned} \lim_{t_i^* \rightarrow 0} d\tau_i^*/d\bar{y} &= -\delta(1 - \epsilon_{v',g} \epsilon_{g,\tau}) v'(0) u''(0)^{-1} > 0 \text{ and} \\ \lim_{\tau_i^* \rightarrow \bar{\tau}} d\tau_i^*/d\bar{y} &= (\delta/2) \left[(2 - \epsilon_{v',g} \epsilon_{g,\tau}) \frac{\alpha E[\tau_i y_i]}{\theta \bar{y}} + \epsilon_{v',g} \epsilon_{g,\tau} \right] v'(g(\bar{\tau})) u''(\bar{\tau})^{-1} < 0. \end{aligned}$$

As an individual's optimal tax rate decreases with income, we obtain the third statement.

Regarding statement *iv*), from implicit differentiation of (10) we obtain

$$\begin{aligned} \frac{d\tau_i^*}{d\alpha} &= -\frac{v''(g(\tau_i^*)) g'(\tau_i^*) \frac{\partial g}{\partial \alpha} + v'(g(\tau_i^*)) \frac{\partial g'}{\partial \alpha}}{u''(\tau_i^*)} \\ &= \frac{(1 - \epsilon_{v',g} \epsilon_{g,\tau}) (\tau_i^* \bar{y} - E[\tau_i y_i]) + \tau_i^* \bar{y}}{\theta u''(\tau_i^*)} \delta v'(g(\tau_i^*)). \end{aligned} \quad (13)$$

Thus, from our assumption regarding v' and (9) we obtain

$$\begin{aligned} \lim_{\tau_i^* \rightarrow 0} d\tau_i^*/d\alpha &= -\delta \theta^{-1} (1 - \epsilon_{v',g} \epsilon_{g,\tau}) E[\tau_i y_i] v'(0) u''(0)^{-1} > 0 \text{ and} \\ \lim_{\tau_i^* \rightarrow \bar{\tau}} d\tau_i^*/d\alpha &= \delta \theta^{-1} [(1 - \epsilon_{v',g} \epsilon_{g,\tau}) (\bar{\tau} \bar{y} - E[\tau_i y_i]) + \bar{\tau} \bar{y}] v'(0) u''(1)^{-1} < 0 \end{aligned}$$

as $\bar{\tau} \bar{y} - E[\tau_i y_i] > 0$.

Statement v) follows directly from implicit differentiation of (10):

$$\begin{aligned}\frac{d\tau_i^*}{d\delta} &= -\frac{v''(g(\tau_i^*))g'(\tau_i^*)\frac{\partial g}{\partial \delta} + v'(g(\tau_i^*))\frac{\partial g'}{\partial \delta}}{u''(\tau_i^*)} \\ &= -\frac{(1 - \epsilon_{v',g})g'(\tau_i^*)v'(g(\tau_i^*))}{\delta u''(\tau_i^*)} > 0.\end{aligned}\quad (14)$$

Finally, statement vi) follows from

$$\begin{aligned}\frac{d\tau_i^*}{d\theta} &= -\frac{-\frac{y_i}{\theta^2}\tau_i^* + v''(g(\tau_i^*))g'(\tau_i^*)\frac{\partial g}{\partial \theta} + v'(g(\tau_i^*))\frac{\partial g'}{\partial \theta}}{u''(\tau_i^*)} \\ &= \frac{\tau_i^*y_i}{\theta^2 u''(\tau_i^*)} + \frac{-\theta(1 - \epsilon_{v',g}\epsilon_{g,\tau})E[x; \tau_i^*] - (1 + \alpha)\tau_i^*\bar{y}}{\theta^2 u''(\tau_i^*)}\delta v'(g(\tau_i^*)).\end{aligned}\quad (15)$$

Substituting $v'(g(\tau_i^*)) = y_i \frac{(\theta - \tau_i^*)}{\theta g'(\tau_i^*)}$ in (15) and using (10) this can be written as

$$\frac{d\tau_i^*}{d\theta} = -\frac{(\alpha\bar{y} + E[x; \tau_i^*])\tau_i^* + (\theta - \tau_i^*)(1 - \epsilon_{v',g}\epsilon_{g,\tau})E[x; \tau_i^*]}{\theta^2 u''(\tau_i^*)g'(\tau_i^*)}\delta y_i > 0, \quad (16)$$

which proves the last statement.

4.3 Proof of Proposition 4

Making use of our assumption $t = \tau$, from (5) we obtain

$$\frac{dx_i}{dy_i} = \frac{(1 + \alpha)\tau_m^* - \alpha\tau_i}{\theta} - \frac{\alpha y_i}{\theta} \frac{d\tau_i^*}{dy_i} > 0, \text{ and} \quad (17)$$

$$\frac{dx_i}{dy_m} = \frac{(1 + \alpha)y_i}{\theta} \frac{d\tau_m^*}{dy_m} < 0, \quad (18)$$

as from Proposition 2 we have $\frac{d\tau_i^*}{dy_i} < 0$ for $\forall i$, which proves the two statements.

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Supplementary Material

This supplementary material contains details on variable definitions, data sources and descriptive statistics (Tables 2, 3 and 4, and Figures 1, 2, 3 and 4), robustness checks (Tables 5, 6, 7 and 8), the correlation matrix (Table 9), and the number of surveys by country and year (Table 10).

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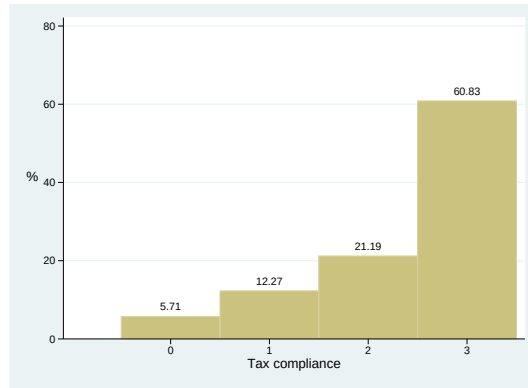


Figure 1: Respondents' tax compliance (4 point scale).

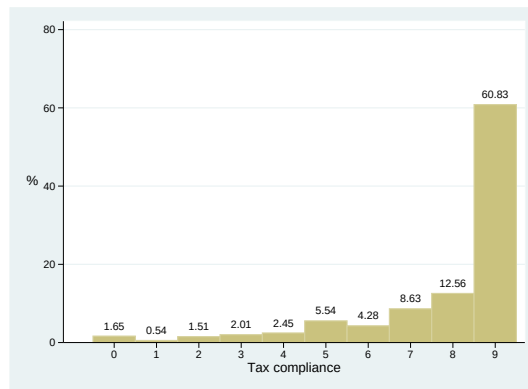


Figure 2: Respondents' tax compliance (10 point scale).

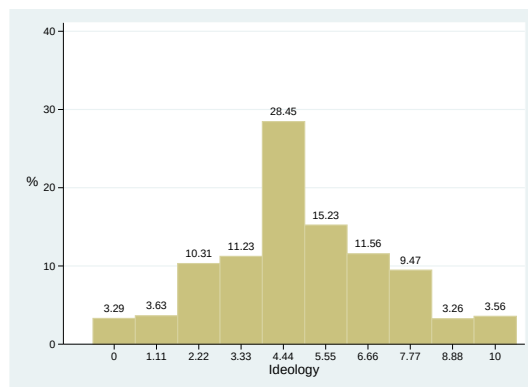


Figure 3: Respondents' ideology (from left(0) to right(10)).



Figure 4: Respondents' tax compliance by country.

Variable	Definition	Measurement	Source
Tax compliance	Respondents' tax compliance	Rescaled into a four-point scale. Responses 7 through 10 were combined into a value 0 (low), responses 4, 5 and 6 were recoded as 1 (medium low); responses 2 and 3 recoded as 2 (medium high); and 1 is recoded as 3 (high).	WVS (2015)/EVS (2015) .
Income	Respondents' income level	Household income level before taxes and deductions on a ten-point scale.	WVS (2015)/EVS (2015) .
Public sector size	Size of the public sector	Total general government expenditure as percentage of GDP.	OECD (2018) .
Ideology	Respondents' ideological stance	Rescaled to take values between 0 (left) and 10 (right).	WVS (2015)/EVS (2015) .
Ideological distance	Difference between the respondent's and government ideologies	Difference between each respondent's ideology and that of her government calculated as the unweighted mean of all parties in the cabinet.	Döring and Manow (2017) .
Weighted ideological distance	Difference between the respondent's and government ideologies	Difference between the respondent's ideology and that of her government calculated as a weighted mean by occupied seats in the cabinet.	Döring and Manow (2017) .
Ideological distance to prime minister	Difference between the respondent's and government ideologies	Difference between the respondent's ideology and that of the prime minister's party.	Döring and Manow (2017) .
Tax revenue	Total revenue from taxes	Total tax revenue as percentage of GDP.	OECD (2018) .
Government effectiveness	Perceptions of (i) the quality of public services, (ii) its independence from political parties, and (iii) the credibility of government.	Ranges from -2.5 (weak) to 2.5 (strong)	World Bank. (2018b) .
Inflation	Annual inflation	Annual percentage change in consumer prices.	World Bank. (2018a) .
Unemployment	Unemployment rate	Share of total labor force.	World Bank. (2018a) .
Age	Respondents' age	Respondent's age calculated using the year of birth.	WVS (2015)/EVS (2015) .
Female	Respondents' gender	Dichotomous variable taking value 1 for female and 0 for male.	WVS (2015)/EVS (2015) .
Religious	Respondents' religious beliefs	Dichotomous variable taking value 1 if the respondent declares to be a religious person and 0 if otherwise (not religious or convinced atheist).	WVS (2015)/EVS (2015) .
Patriotic	Respondents' patriotic feelings	Dichotomous variable taking vale 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).	WVS (2015)/EVS (2015) .

Table 2: Data definitions and sources.

Variable	Definition	Measurement	Source
Educational level	Respondents' educational level	Three dummy variables (low, medium and high) accounting for whether the respondent has adequately or inadequately completed primary (compulsory), secondary or tertiary education respectively.	WVS (2015) / EVS (2015) .
Unemployed	Respondents' occupational status as unemployed	Dichotomous variable taking value 1 if the respondent is currently unemployed and 0 if otherwise.	WVS (2015) / EVS (2015) .
Self-employed	Respondents' occupational status as self-employed	Dichotomous variable taking value 1 if the respondent is currently self-employed and 0 if otherwise.	WVS (2015) / EVS (2015) .
Retired	Respondents' occupational status as retired	Dichotomous variable taking value 1 if the respondent is retired/pensioned and 0 if otherwise.	WVS (2015) / EVS (2015) .
Other	Respondents' occupational status as other	Dichotomous variable taking value 1 if the respondent is: in military service, housewife not otherwise employed, student, not working because of disability, other reasons; and 0 if otherwise.	WVS (2015) / EVS (2015) .
Married / Partnership	Respondents' marital status as married or in a partnership	Dichotomous variable taking value 1 if the respondent is currently married or in a partnership and 0 if otherwise.	WVS (2015) / EVS (2015) .
Divorced / Separated	Respondents' marital status as divorced or separated	Dichotomous variable taking value 1 if the respondent is currently divorced or separated and 0 if otherwise.	WVS (2015) / EVS (2015) .
Widowed	Respondents' marital status as widowed	Dichotomous variable taking value 1 if the respondent is currently widowed and 0 if otherwise.	WVS (2015) / EVS (2015) .

Table 2: Continued. Data definitions and sources.

Variable	Value	Frequency	Percent
Tax compliance	Low	2,727	5.71
	Medium Low	5,863	12.27
	Medium High	10,122	21.19
	High	29,060	60.83
	<i>Total</i>	47,772	100
Gender	Male	23,736	49.69
	Female	24,036	50.31
	<i>Total</i>	47,772	100
Religious beliefs	Non religious	20,247	42.38
	Religious	27,525	57.62
	<i>Total</i>	47,772	100
Patriotism	Non patriotic	5,705	11.94
	Patriotic	42,067	88.06
	<i>Total</i>	47,772	100
Educational level	Low	9,728	20.36
	Medium	23,625	49.45
	High	14,419	30.18
	<i>Total</i>	47,772	100
Occupational status	Employed	24,449	51.18
	Unemployed	2,596	5.43
	Self-employed	3,038	6.36
	Retired	9,795	20.50
	Other	7,894	16.52
	<i>Total</i>	47,772	100
Marital status	Never married	9,929	20.78
	Married / partnership	30,580	64.01
	Divorced / separated	4,189	8.77
	Widowed	3,074	6.43
	<i>Total</i>	47,772	100

Table 3: Descriptive statistics of categorical variables.

Variable	Mean	Std. Dev.	Min	Max
<i>Individual-level variables</i>				
Income	5.147	2.526	1	10
Ideological distance	-.195	2.741	-8.661	8.059
Weighted ideological distance	-.266	2.760	-8.661	7.002
Ideological distance to prime minister	-.2999	2.848	-8.661	7.372
Age	46.941	16.907	15	99
Ideology	4.908	2.246	0	10
<i>Country-level variables</i>				
Tax revenue	34.394	7.140	23.06 TUR 2007	48.80 SWE 1999
Public sector size	-.249	6.853	-12.35 SWI 2007	18.05 SWE 1996
Government effectiveness	1.628	.437	.31 TUR 2007	2.13 FIN 2013
Inflation	2.199	1.717	-.72 JAP 2010	8.76 TUR 2007
Unemployment	7.787	3.878	2.20 ICE 1999	22.70 SPA 1995

Table 4: Descriptive statistics of continuous variables

	(I)		(II)	
	Tax compliance oprobit	ME	Tax compliance oprobit	ME
Income	-0.010*** (0.001)	-0.354	-0.011*** (0.000)	-0.396
Tax revenue	-0.013** (0.031)	-0.465	-0.014*** (0.002)	-0.511
Ideological distance	-0.009** (0.022)	-0.334		
x Public sector size	-0.002*** (0.003)	-0.064		
Government effectiveness	-0.216*** (0.001)	-7.663	-0.165** (0.011)	-5.846
Inflation	-0.040*** (0.000)	-1.434	-0.032*** (0.000)	-1.123
Unemployment	0.011*** (0.007)	0.401	0.005 (0.251)	0.161
Age	0.009*** (0.000)	0.319	0.009*** (0.000)	0.318
Female (Ref.: Male)	0.209*** (0.000)	7.432	0.210*** (0.000)	7.488
Religious (Ref.: Non religious)	0.149*** (0.000)	5.341	0.144*** (0.000)	5.145
Patriotic (Ref.: Non patriotic)	0.167*** (0.000)	6.023	0.160*** (0.000)	5.772
Educational level (Ref.: Low)				
Medium	0.001 (0.977)	0.019	-0.000 (0.982)	-0.015
High	0.039 (0.109)	1.366	0.039 (0.112)	1.381
Occupational status (Ref.: Employed)				
Unemployed	-0.068** (0.034)	-2.453	-0.065** (0.038)	-2.331
Self employed	-0.102*** (0.003)	-3.675	-0.107*** (0.002)	-3.860
Retired	0.073*** (0.003)	2.582	0.071*** (0.004)	2.519
Other	0.039** (0.042)	1.370	0.037* (0.050)	1.310
Marital status (Ref.: Never married)				
Married / living together	0.083*** (0.000)	2.955	0.083*** (0.000)	2.963
Divorced / separated	-0.059*** (0.007)	-2.141	-0.057*** (0.008)	-2.080
Widowed	0.060* (0.064)	2.144	0.058* (0.076)	2.071
Constant cut1	-2.488*** (0.000)		-2.474*** (0.000)	
Constant cut2	-2.368*** (0.000)		-2.353*** (0.000)	
Constant cut3	-2.125*** (0.000)		-2.111*** (0.000)	
Constant cut4	-1.903*** (0.000)		-1.889*** (0.000)	
Constant cut5	-1.703*** (0.000)		-1.689*** (0.000)	
Constant cut6	-1.378*** (0.000)		-1.364*** (0.000)	
Constant cut7	-1.186*** (0.000)		-1.172*** (0.000)	
Constant cut8	-0.870*** (0.001)		-0.857*** (0.000)	
Constant cut9	-0.491* (0.062)		-0.478** (0.016)	
Observations	47,772		47,772	
Pseudo R-squared	0.0403		0.0400	

Table 5: Estimation results with a 10-point scale dependent variable. Ordered probit with clustered standard errors by country (23 clusters). All estimations include country and time fixed effects. Marginal effects (ME) in percentage points. Robust p-values in parentheses where ***, ** and * indicate $p < 0.01$, $p < 0.05$ and $p < 0.1$, respectively.

	(I)		(II)		(III)	
	Tax compliance GLM	ME	Tax compliance GLM	ME	Ideology GLM	ME
Income	-0.005* (0.073)	-0.110	-0.007** (0.024)	-0.135	0.014*** (0.000)	0.570
Tax revenue	-0.012* (0.057)	-0.242	-0.012** (0.045)	-0.244		
Ideological distance	-0.011*** (0.002)	-0.223				
x Public sector size	-0.001*** (0.008)	-0.027				
Government effectiveness	-0.190*** (0.007)	-3.840	-0.123* (0.097)	-2.499		
Inflation	-0.034*** (0.000)	-0.697	-0.026*** (0.002)	-0.527		
Unemployment	0.014*** (0.001)	0.276	0.008** (0.021)	0.157		
Age	0.007*** (0.000)	0.149	0.007*** (0.000)	0.148	0.002** (0.012)	0.067
Female (Ref.: Male)	0.175*** (0.000)	3.550	0.177*** (0.000)	3.592	-0.055*** (0.000)	-2.164
Religious (Ref.: Non religious)	0.115*** (0.000)	2.346	0.108*** (0.000)	2.215	0.157*** (0.000)	6.187
Patriotic (Ref.: Non patriotic)	0.157*** (0.000)	3.393	0.149*** (0.000)	3.208	0.180*** (0.000)	7.088
Educational level (Ref.: Low)						
Medium	0.011 (0.517)	0.225	0.010 (0.532)	0.215	-0.010 (0.713)	-0.410
High	0.079*** (0.001)	1.581	0.080*** (0.001)	1.604	-0.064 (0.107)	-2.530
Occupational status (Ref.: Employed)						
Unemployed	-0.083*** (0.000)	-1.776	-0.080*** (0.000)	-1.710	-0.018 (0.238)	-0.694
Self employed	-0.088*** (0.003)	-1.883	-0.093*** (0.002)	-1.996	0.072*** (0.000)	2.852
Retired	0.060*** (0.005)	1.181	0.058*** (0.006)	1.148	0.004 (0.786)	0.154
Other	0.040*** (0.008)	0.800	0.038** (0.011)	0.768	0.046*** (0.000)	1.817
Marital status (Ref.: Never married)						
Married / living together	0.069*** (0.000)	1.402	0.069*** (0.000)	1.397	0.032* (0.078)	1.243
Divorced / separated	-0.072*** (0.001)	-1.572	-0.070*** (0.001)	-1.534	-0.013 (0.341)	-0.519
Widowed	0.031 (0.292)	0.640	0.028 (0.336)	0.589	0.054*** (0.001)	2.131
Constant	1.296*** (0.000)		1.214*** (0.000)		-0.364*** (0.000)	
Observations	47,772		47,772		47,772	
AIC	0.6141		0.6146		0.9840	
BIC	-497769.5		-497748.1		-503858.3	

Table 6: GLM estimation results. GLM with clustered standard errors by country (23 clusters). All estimations include country and time fixed effects. Marginal effects (ME) in percentage points. Robust p-values in parentheses where ***, ** and * indicate $p < 0.01$, $p < 0.05$ and $p < 0.1$, respectively.

	(I)		(II)		(III)	
	Tax compliance		Tax compliance		Tax compliance	
	oprobit	ME	oprobit	ME	oprobit	ME
Income	-0.010*** (0.002)	-0.355	-0.010*** (0.002)	-0.354	-0.010*** (0.002)	-0.351
Tax revenue	-0.013** (0.035)	-0.455	-0.012** (0.048)	-0.439	-0.009 (0.120)	-0.320
Ideological distance	-0.009** (0.025)	-0.328				
x Public sector size	-0.002*** (0.002)	-0.067				
Weighted ideological distance			-0.009** (0.023)	-0.322		
x Public sector size			-0.002*** (0.002)	-0.068		
Ideological distance to prime minister					-0.010** (0.014)	-0.347
x Public sector size					-0.002*** (0.001)	-0.070
Government effectiveness	-0.216*** (0.001)	-7.647	-0.207*** (0.001)	-7.355	-0.209*** (0.000)	-7.420
Inflation	-0.040*** (0.000)	-1.402	-0.041*** (0.000)	-1.446	-0.040*** (0.000)	-1.429
Unemployment	0.012*** (0.003)	0.414	0.012*** (0.002)	0.424	0.014*** (0.000)	0.480
Age	0.009*** (0.000)	0.327	0.009*** (0.000)	0.327	0.009*** (0.000)	0.327
Female (Ref.: Male)	0.206*** (0.000)	7.335	0.206*** (0.000)	7.339	0.206*** (0.000)	7.335
Religious (Ref.: Non religious)	0.150*** (0.000)	5.375	0.150*** (0.000)	5.369	0.151*** (0.000)	5.387
Patriotic (Ref.: Non patriotic)	0.168*** (0.000)	6.068	0.168*** (0.000)	6.062	0.169*** (0.000)	6.083
Educational level (Ref.: Low)						
Medium	0.001 (0.941)	0.049	0.001 (0.942)	0.048	0.002 (0.920)	0.066
High	0.031 (0.213)	1.094	0.031 (0.213)	1.095	0.032 (0.204)	1.117
Occupational status (Ref.: Employed)						
Unemployed	-0.063* (0.073)	-2.248	-0.063* (0.073)	-2.248	-0.062* (0.074)	-2.240
Self employed	-0.102*** (0.003)	-3.677	-0.102*** (0.003)	-3.678	-0.101*** (0.003)	-3.656
Retired	0.072*** (0.004)	2.532	0.072*** (0.004)	2.538	0.072*** (0.004)	2.535
Other	0.036* (0.052)	1.294	0.036* (0.053)	1.288	0.036* (0.052)	1.293
Marital status (Ref.: Never married)						
Married / living together	0.085*** (0.000)	3.020	0.085*** (0.000)	3.021	0.085*** (0.000)	3.022
Divorced / separated	-0.052** (0.026)	-1.876	-0.052** (0.026)	-1.872	-0.052** (0.026)	-1.875
Widowed	0.060* (0.096)	2.137	0.060* (0.095)	2.141	0.060* (0.094)	2.152
Constant cut1	-1.885*** (0.000)		-1.862*** (0.000)		-1.758*** (0.000)	
Constant cut2	-1.168*** (0.000)		-1.146*** (0.000)		-1.042*** (0.000)	
Constant cut3	-0.475* (0.065)		-0.452* (0.085)		-0.348 (0.172)	
Observations	47,772		47,772		47,772	
Pseudo R-squared	0.0532		0.0532		0.0532	

Table 7: Estimation results with alternative ideological distance measures. Ordered probit with clustered standard errors by country (23 clusters). All estimations include country and time fixed effects. Marginal effects (ME) in percentage points. Robust p-values in parentheses where ***, ** and * indicate $p < 0.01$, $p < 0.05$ and $p < 0.1$, respectively.

	(I) Tax compliance		(II) Tax compliance		(III) Ideology	
	oprobit	ME	oprobit	ME	oprobit	ME
Income	-0.010*** (0.010)	-0.368	-0.011*** (0.002)	-0.417	0.037*** (0.000)	0.244
Tax revenue	-0.033 (0.174)	-1.203	-0.027 (0.236)	-0.982		
Ideological distance	-0.010* (0.050)	-0.352				
x Public sector size	-0.002*** (0.005)	-0.066				
Government effectiveness	-0.313** (0.033)	-11.482	-0.230 (0.115)	-8.461		
Inflation	-0.028** (0.024)	-1.045	-0.021* (0.080)	-0.768		
Unemployment	0.015*** (0.004)	0.561	0.007 (0.271)	0.251		
Age	0.009*** (0.000)	0.349	0.009*** (0.000)	0.348	0.003* (0.051)	0.018
Female (Ref.: Male)	0.204*** (0.000)	7.541	0.206*** (0.000)	7.610	-0.100*** (0.000)	-0.664
Religious (Ref.: Non religious)	0.162*** (0.000)	6.022	0.157*** (0.000)	5.810	0.295*** (0.000)	1.821
Patriotic (Ref.: Non patriotic)	0.187*** (0.000)	6.990	0.179*** (0.000)	6.682	0.358*** (0.000)	1.802
Educational level (Ref.: Low)						
Medium	-0.008 (0.664)	-0.311	-0.009 (0.632)	-0.348	0.022 (0.605)	0.151
High	0.021 (0.438)	0.776	0.022 (0.446)	0.792	-0.096 (0.233)	-0.604
Occupational status (Ref.: Employed)						
Unemployed	-0.059 (0.127)	-2.198	-0.056 (0.138)	-2.085	-0.039 (0.177)	-0.238
Self employed	-0.091*** (0.003)	-3.407	-0.097*** (0.002)	-3.614	0.137*** (0.000)	0.980
Retired	0.075*** (0.003)	2.759	0.073*** (0.004)	2.689	0.032 (0.187)	0.209
Other	0.052*** (0.006)	1.914	0.050*** (0.008)	1.833	0.077*** (0.000)	0.526
Marital status (Ref.: Never married)						
Married / living together	0.103*** (0.000)	3.815	0.103*** (0.000)	3.816	0.035 (0.123)	0.231
Divorced / separated	-0.039 (0.109)	-1.451	-0.037 (0.117)	-1.395	-0.031 (0.281)	-0.187
Widowed	0.076* (0.060)	2.802	0.073* (0.071)	2.713	0.101*** (0.001)	0.697
Constant cut1	-2.457*** (0.002)		-2.220*** (0.002)		-1.245*** (0.000)	
Constant cut2	-1.729** (0.030)		-1.492** (0.043)		-0.853*** (0.000)	
Constant cut3	-1.042 (0.199)		-0.805 (0.282)		-0.286* (0.056)	
Constant cut4					0.107 (0.447)	
Constant cut5					0.902*** (0.000)	
Constant cut6					1.324*** (0.000)	
Constant cut7					1.746*** (0.000)	
Constant cut8					2.285*** (0.000)	
Constant cut9					2.624*** (0.000)	
Observations	38,906		38,906		38,906	
Pseudo R-squared	0.0354		0.0349		0.0191	

Table 8: Estimation results excluding Belgium, Greece, Japan, Luxembourg, Norway and Turkey. Ordered probit with clustered standard errors by country (17 clusters). All estimations include country and time fixed effects. Marginal effects (ME) in percentage points. Robust p-values in parentheses where ***, ** and * indicate $p < 0.01$, $p < 0.05$ and $p < 0.1$, respectively.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1)	Tax compliance	1																	
(2)	Income	-0.04	1																
(3)	Tax revenue	-0.15	-0.01	1															
(4)	Ideology	0.03	0.06	-0.06	1														
(5)	Ideological distance	-0.02	0.06	0.10	0.80	1													
(6)	Weighted ideological distance	-0.02	0.07	0.09	0.80	0.99	1												
(7)	Ideo. distance to prime minister	-0.02	0.07	0.10	0.78	0.97	0.98	1											
(8)	Public sector size	-0.12	-0.06	0.84	-0.05	0.14	0.13	0.13	1										
(9)	Government effectiveness	-0.10	0.06	0.39	-0.04	0.05	0.06	0.04	0.20	1									
(10)	Inflation	0.09	-0.01	-0.39	0.07	-0.08	-0.06	-0.05	-0.34	-0.49	1								
(11)	Unemployment	-0.02	-0.13	0.12	-0.08	0.04	0.04	0.04	0.35	-0.31	0.23	1							
(12)	Age	0.15	-0.14	-0.01	0.08	0.05	0.05	0.04	-0.01	0.10	-0.11	-0.05	1						
(13)	Gender	0.09	-0.06	0.00	-0.03	-0.02	-0.02	-0.02	-0.01	0.01	0.01	0.00	-0.02	1					
(14)	Religious	0.09	-0.02	-0.07	0.16	0.11	0.12	0.14	-0.09	-0.10	0.17	0.00	0.12	0.12	1				
(15)	Patriotic	0.07	0.01	-0.02	0.13	0.11	0.12	0.13	-0.07	-0.02	0.16	0.01	0.05	0.02	0.14	1			
(16)	Education	-0.03	0.34	-0.07	-0.02	0.00	-0.01	-0.01	-0.07	0.10	-0.05	-0.19	-0.20	-0.03	-0.07	-0.05	1		
(17)	Occupational status	0.09	-0.26	-0.04	0.04	0.00	0.00	0.00	-0.02	-0.11	0.10	0.08	0.33	0.16	0.11	0.03	-0.23	1	
(18)	Marital status	0.08	-0.12	0.01	0.04	0.04	0.04	0.04	0.01	0.08	-0.05	-0.02	0.49	0.14	0.09	0.03	-0.15	0.15	1

Table 9: Correlation matrix.

	1995	1996	1997	1998	1999	2000	2004	2005	2006	2007	2010	2011	2012	Total
Australia	1,501	-	-	-	-	-	-	1,188	-	-	-	-	981	3,670
Austria	-	-	-	-	900	-	-	-	-	-	-	-	-	900
Belgium	-	-	-	-	1,049	-	-	-	-	-	-	-	-	1,049
Canada	-	-	-	-	-	1,446	-	-	1,317	-	-	-	-	2,763
Denmark	-	-	-	-	697	-	-	-	-	-	-	-	-	697
Finland	-	766	-	-	-	715	-	815	-	-	-	-	-	2,296
France	-	-	-	-	960	-	-	-	800	-	-	-	-	1,760
Germany	-	-	1,225	-	1,158	-	-	-	1,484	-	-	-	-	3,867
Greece	-	-	-	-	757	-	-	-	-	-	-	-	-	757
Iceland	-	-	-	-	784	-	-	-	-	-	-	-	-	784
Ireland	-	-	-	-	666	-	-	-	-	-	-	-	-	666
Italy	-	-	-	-	1,180	-	-	518	-	-	-	-	-	1,698
Japan	-	-	-	-	-	735	-	649	-	-	1,169	-	-	2,553
Luxembourg	-	-	-	-	273	-	-	-	-	-	-	-	-	273
Netherlands	-	-	-	-	860	-	-	-	592	-	-	-	1398	2,850
New Zealand	-	-	-	606	-	-	477	-	-	-	-	439	-	1,522
Norway	-	984	-	-	-	-	-	-	-	895	-	-	-	1,879
Spain	633	-	-	-	572	682	-	-	-	916	-	862	-	3,665
Sweden	-	820	-	-	841	-	-	-	856	-	-	962	-	3,479
Switzerland	-	679	-	-	-	-	-	-	-	844	-	-	-	1,523
Turkey	-	-	-	-	-	-	-	-	-	1,036	-	1,319	-	2,355
United Kingdom	-	-	-	-	813	-	-	625	-	-	-	-	-	1,438
United States	1,150	-	-	-	1,036	-	-	-	1,125	-	-	2,017	-	5,328
Total	3,284	3,249	1,225	606	12,546	3,578	477	3,795	6,174	3,691	1,169	5,599	2379	47,772

Table 10: Observations by country and year.