Drivers of compliance intentions and actual tax behaviour: Consistent and inconsistent taxpayers

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Drivers of compliance intentions and actual tax behaviour: Consistent and inconsistent taxpayers

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Abstract

This paper analyses six waves of survey data on the tax compliance of Estonian residents, collected between 2018 and 2023. It studies the behavioural mechanisms underlying compliance by applying the theory of planned behaviour, where intentions mediate the effects of attitudes, norms, and perceived control on behaviour. The analysis uses structural equation modelling, allowing latent constructs and observed intentions to be jointly estimated. The results confirm the relevance of this model in explaining tax compliance, with social norms and tax morale being more prominent in shaping compliance intentions than deterrence. Using a novel taxonomy of consistent and inconsistent taxpayers, defined by the alignment of intentions and behaviour, the paper documents pronounced heterogeneity across these groups: for consistent taxpayers, compliance intentions are shaped by both intrinsic and external factors with intrinsic motivation dominating, while for inconsistent taxpayers external factors are of key importance. These findings highlight the relevance of psychological mechanisms in tax behaviour and have implications for targeted policy design beyond standard rational choice models.

JEL Codes: H26, H30, H83, D91

Keywords: tax evasion, theory of planned behaviour, mediation analysis, tax morale, attitudes, beliefs, perceived behavioural control, subjective norms, monetary and non-monetary motives, behavioural choice, reciprocity

The views expressed are those of the author and do not necessarily represent the official views of Eesti Pank or the Eurosystem.

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Non-technical summary

Tax compliance is often discussed as an economic calculation in which people compare the potential gains from evading taxes with the risks of detection and punishment. Research increasingly suggests however that tax behaviour cannot be explained by pecuniary motives alone. People may also pay taxes because they believe the system to be fair, because they trust public institutions, because they feel peer pressure to comply, or simply because they consider that paying taxes is the right thing to do. Understanding which of these drivers of tax behaviour matter most is important not only theoretically, but also for designing effective tax policy.

This paper studies these broader motivations using survey data collected from Estonian residents between 2018 and 2023. The analysis draws on responses from roughly 7,600 individuals and examines both whether people comply with taxes, and why they choose to do so. The study does not focus purely on deterrence and cost-benefit analysis, but applies the theory of planned behaviour, which is a framework from social psychology that links attitudes, social norms, perceived behavioural control, intentions, and actual behaviour. Perceived behavioural control means how easy or difficult people think tax evasion would be, and covers their perceptions about audits, the risk of detection, opportunities for evading taxes, and knowledge about how to declare and pay taxes correctly. The paper jointly analyses compliance intentions and realised behaviour, making it possible to understand better how underlying motivations translate into actual actions.

The results show that social and moral factors matter much more for tax compliance than traditional deterrence mechanisms. Social norms and tax morale in particular emerge as the strongest and most stable predictors of compliance intentions. People are more likely to comply when they believe that tax compliance is socially expected and morally appropriate. By contrast, factors such as the perceived risk of audits or the ease of evasion play a considerably smaller role. The findings also highlight the importance of institutional trust and perceptions of fairness. Positive views of the tax system and public services mainly strengthen compliance indirectly by shaping social norms and moral motivation. In other words, taxpayers who perceive the system to be fair and functioning well are more likely to internalise compliance as the right thing to do.

One of the central contributions of the paper is the distinction it draws between consistent and inconsistent taxpayers. Consistent taxpayers are those whose intentions and behaviour align, as they are people who intend to comply and actually do so, or people who intend not to comply and then indeed evade their taxes. Inconsistent taxpayers by contrast display a mismatch between intentions and behaviour. The analysis reveals substantial differences between these groups. Compliance intentions for consistent taxpayers are driven primarily by internal motivations and social norms and are less dependent on external circumstances. The intentions of inconsistent taxpayers are shaped mainly by perceptions of fairness, trust in institutions, and reciprocity motives, while moral motivation appears to be largely irrelevant.

This distinction has important implications for tax policy, as it suggests that traditional enforcement measures may not be enough to improve compliance. Policies aimed at strengthening institutional credibility, improving communication and fostering perceptions of fairness may be particularly effective for groups that are sensitive to external signals and institutional quality.

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1. Introduction

A large number of studies on tax compliance apply the Allingham & Sandmo (1972) model, which treats tax evasion as an individual choice under uncertainty. Individuals weigh the potential benefits from underreporting income against the likelihood of detection and financial penalties. Despite often struggling to explain observed compliance levels when applied empirically (Slemrod & Yitzhaki 2002, Kirchler 2007), the rational choice framework remains one of the dominant paradigms in economics.

This paper takes a different perspective from purely rational choice approaches by applying the theory of planned behaviour (TPB) developed by Ajzen (1991, 2011). This model has been successfully used to explain a broad range of behaviours (Armitage & Conner 2001), but has seen only limited application to tax compliance. The theory of planned behaviour posits that behaviour is guided by intentions that depend on attitudes, subjective norms, and perceived behavioural control, the latter reflecting factors that may facilitate or hinder action.

While behavioural models with mediated relationships are standard in social psychology, a large part of economics literature typically focuses either on observed behaviour or on behavioural intentions alone. The link between intentions and actual behaviour is studied less often within a single theoretical framework. This paper addresses this gap by jointly analysing compliance intentions and realised behaviour, providing a clearer view of the individual decision-making process underlying tax evasion.

The analysis uses a granular survey on the willingness to pay taxes that was conducted among roughly 7600 respondents in Estonia across seven survey waves between 2018 and 2023. The survey is administered by the Estonian Tax and Customs Board (EMTA, from Eesti Maksu- ja Tolliamet). The dataset contains a large number of questions covering attitudes, perceptions and behavioural intentions, which allows us to model the different components of the TPB framework. The empirical analysis employs latent factor analysis within a structural equation modelling framework (SEM), which is well suited for capturing the structure from the TPB and estimating relationships between latent psychological constructs and observed behaviour.

There are several steps to the empirical analysis. We estimate a baseline model that closely follows the TPB framework and examine the relationships between general attitudes, subjective norms, perceived behavioural control, intentions to comply, and tax compliance. We also allow for a mediation channel in which norms transmit the effect of attitudes on compliance intentions. We then refine the model by decomposing broad factors into more specific components, such as separating tax morale from social norms and distinguishing attitudes towards the tax authorities. Finally, we test the robustness of the results using alternative measures of compliance and intentions, and different model specifications.

The core of the paper is the analysis of heterogeneity among taxpayers, which is relevant for targeted policy design. The paper introduces a novel distinction between consistent and inconsistent taxpayers and uses it to examine how the drivers of compliance intentions and actual behaviour differ across these groups. We also examine heterogeneity across selected socio-demographic groups to assess whether the main relationships vary by gender, nationality, education, age, and economic security.

The paper makes several contributions to the literature on tax compliance. The first is that it extends the TPB framework to tax behaviour by incorporating factors that are particularly relevant for tax compliance decisions, while preserving the full three-stage structure linking underlying factors, intentions, and behaviour. Second, it moves beyond the traditional dichotomy between compliers and evaders by introducing the concept of inconsistent taxpayers and showing that taxpayer heterogeneity matters for understanding compliance behaviour.

Third, the paper contributes to the literature by documenting the importance of social norms and moral motivations in shaping tax behaviour relative to purely rational choice models. Finally, the analysis highlights the importance of perceptions about institutions, including attitudes towards the tax authorities and views about fairness and service quality, in influencing compliance intentions.

2. Related literature

The literature on tax compliance is extensive, and the discussion here is not intended to be comprehensive, but rather to highlight key contributions that have shifted the focus from purely deterrence-based models towards behavioural and social or psychological explanations. For a detailed overview of the tax compliance literature see Levenko & Staehr (2023). This section reviews the literature relevant to the TPB and motivates the empirical approach. Subsection 2.1 provides a brief overview of the main approaches in the tax compliance literature, including rational choice models and early attempts to incorporate psychological factors. Subsection 2.2 then introduces the theory of planned behaviour and discusses its application to tax compliance.

2.1 Early literature

Theoretical contributions beyond purely rational choice models highlight the heterogeneity of taxpayers. Yitzhaki (1974) allows taxpayers to differ in their risk preferences, while Erard & Feinstein (1994) extend the standard compliance model by introducing a group of inherently honest taxpayers. Their framework uses game theory to show that recognising that there are honest individuals improves predictions and leads to more nuanced policy implications.

Experimental evidence further challenges the narrow view focused on deterrence. Alm et al. (1992a, 1992b) show that compliance increases when taxpayers perceive there to be a link between taxes paid and the provision of public goods. Other studies find that respectful treatment by the tax authorities fosters compliance, underscoring the role of non-pecuniary motivations and institutional trust (Kirchler et al. 2010, Hashimzade et al. 2013, Luttmer & Singhal 2014).

A more systematic shift towards psychological explanations is found in a series of studies by Elffers, Hessing and Weigel (see Elffers et al. 1987; Weigel et al. 1987, 1999; Hessing et al. 1988; Elffers & Hessing 1997). They show that taxpayers do not base their position only on an audit of probabilities and penalties, as decisions about compliance are largely shaped by moral norms, social influence and individual attitudes. Personal moral standards and the perception that others are complying with their tax obligations can sustain compliance even when the risk of detection for non-compliance is low.

Elffers et al. (1987) and Hessing et al. (1988) describe tax compliance as a social trade-off between individual benefit and collective welfare, or as the outcome of instigations and constraints. Behaviour results from the interaction of situational opportunities and constraining forces such as internalised norms or enforcement. This perspective is close to an intention-based model of behaviour and is rooted in the theory of reasoned action (Ajzen & Fishbein 1980), which was a precursor to the theory of planned behaviour. TPB formalises these elements through attitudes, subjective norms and perceived behavioural control, and so provides a structured framework for analysing decisions about tax compliance.

2.2 Theory of planned behaviour

The theory of planned behaviour is a general model in social psychology that extends the theory of reasoned action (Ajzen & Fishbein 1980) by incorporating perceived behavioural control alongside attitudes and social norms. The model has been widely validated and applied in different empirical settings (see Ajzen & Driver 1991, Parker et al. 1995, Armitage & Conner 2001). In the context of tax evasion, the TPB provides an integrative framework for analysing decisions about compliance. This subsection first outlines the main components of the TPB and then reviews how they have been applied in empirical studies of tax compliance.

Although the TPB has been used to study tax behaviour in a number of studies, the literature remains relatively limited compared to that in other domains. Moreover, existing studies typically focus on compliance intentions rather than the full structure linking attitudes, intentions, and behaviour, and therefore do not fully exploit the TPB framework. The present paper advances this literature by applying the full TPB structure to jointly analyse compliance intentions and observed behaviour, and by examining heterogeneity across taxpayers.

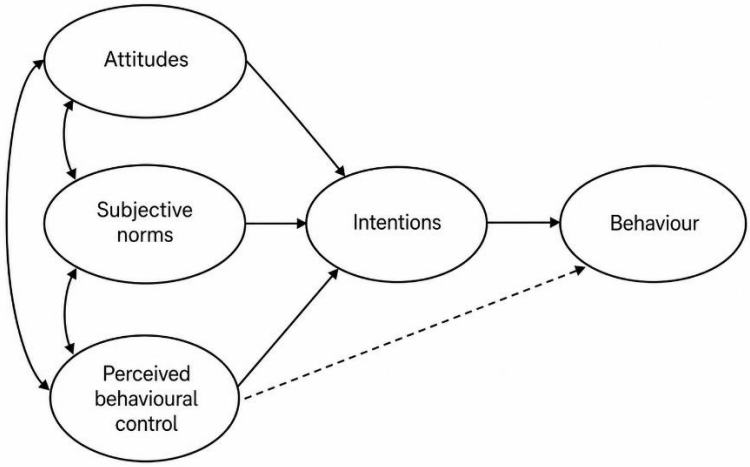

Figure 1. Original theory of planned behaviour

Notes: The diagram presents the TPB model. The relationship of perceived behavioural control and behaviour is shown by a dashed arrow to indicate that this effect may be absent.

The TPB posits that behaviour is not a direct outcome of underlying predispositions. It argues rather that intentions intervene between an inclination towards the behaviour and the actual outcomes, and constraints may prevent those intentions being translated into action. In this framework, intention is a mediator between predisposition and behaviour. The original model posits three determinants of behavioural intention, which are attitudes towards the behaviour, subjective norms, and perceived behavioural control (PBC). Figure 1 is a schematic representation of the core TPB, while Figure 2 extends it to include attitudes towards tax authorities, tax morale and actual control.[1]

Attitudes. Attitudes refers to how positively or negatively a person rates a specific behaviour (Ajzen 1991). Attitudes towards tax compliance may include the desire to minimise taxes, a willingness to engage in illegal behaviour, feelings of guilt, concerns about fairness and equity, and perceptions of the risk of penalties (Bobek & Hatfield 2003; Benk et al. 2011; Hanno

[1] In this paper, the terms *tax morale* and *moral norms* are used interchangeably.

& Violette 1996). The perception of penalty risk, however, may also be related to perceived behavioural control.

In contrast to a broader literature that models attitudes as individual evaluations of a specific behaviour, the present approach links attitudes to institutional perceptions, that is perceptions of the fairness of the tax system, the effectiveness of public institutions, and satisfaction with public services. This is broadly in line with studies that emphasise fairness and trust as key determinants of compliance (Kirchler et al. 2010). At the same time, some elements often included under attitudes in the tax evasion literature, such as perceived deterrence, are treated here as part of perceived behavioural control, in line with the TPB framework.

Subjective norms. Subjective norms are the perceived social pressure to perform or not perform a given behaviour. In the sociology literature, they are typically labelled as second-order beliefs or *social norms* (Bicchieri 2010). Many studies of tax compliance measure this factor quite simply, as Bobek & Hatfield (2003) for example use a single statement: "Most people I know would approve of me engaging in the cheating behaviour". Similarly, Bobek et al. (2007) include only one variable that captures subjective norms, though Taing & Chang (2021) extend the framework by incorporating perceptions of tax fairness and trust in government, which can be also classified as attitudes.

The literature frequently introduces *tax morale*, understood as a moral obligation to pay taxes, as a distinct factor influencing compliance (Torgler & Schaltegger 2006). Moral obligation reflects the belief that cheating is morally wrong, and has been found to be significantly correlated with attitudes (Beck & Ajzen 1991). Bobek & Hatfield (2003) identify willingness to engage in illegal behaviour as a separate determinant of intentions, while Roth et al. (1989) use commitment to obey the law. Taing & Chang (2021) also link compliance intentions to intrinsic motivation, but do not model it separately, instead subsuming it within attitudes.

These two concepts, second-order beliefs or social norms and tax morale or moral norms, are closely related but capture different aspects of behaviour. Social norms reflect external social pressure, while tax morale represents internalised norms. In practice, empirical studies often combine them, either due to data limitations or for simplicity. This may help explain why subjective norms are sometimes found to be weak predictors of behavioural intentions (Armitage & Conner 2001). However, when measured using multiple indicators, their explanatory power tends to increase (Chang 1998).

In this paper, we begin with a coarse specification in which these elements are combined under the umbrella of subjective norms. This is common in the literature, although it is sometimes labelled differently, for example, Luttmer and Singhal (2014) use the term "tax morale" to capture both moral and social norms. We then separate subjective norms into a peer pressure component (social norms) and tax morale (moral norms), see Figure 2. This distinction allows us to disentangle the effects of external social influence and internalised moral motivation, and to assess their relative importance in shaping compliance intentions.

Mediation. In addition to their direct effect on intentions, subjective norms may also mediate the relationship between attitudes and behaviour (Ajzen et al. 2018). This can arise because individuals' evaluations of the tax system may shape how they perceive and interpret social expectations, and how they form their intrinsic motivation. In particular, perceiving the tax system as fair, having trust in government, and being satisfied with public services may strengthen the motivation to comply, thereby reinforcing tax morale (Frey & Feld 2002, Hashimzade et al. 2013). In this way, attitudes can shape compliance indirectly by influencing subjective norms, which in turn affect intentions.

While attitudes, norms and moral obligations are closely related, they capture distinct aspects of decision-making. In this analysis, attitudes reflect perception of the fairness of tax system and satisfaction with tax authorities and public services, social norms capture perceived peer pressure, and tax morale reflects internalised moral obligation independent of social expectations. In the main empirical analysis, these constructs are treated as conceptually distinct but potentially correlated factors.

Perceived behavioural control. PBC is the extent to which individuals feel they have control over whether to perform a behaviour. It includes both internal elements like self-efficacy and external factors like rules or access, which together influence how intentions translate into action. Applying PBC to tax behaviour captures whether individuals know how to pay taxes for example, or whether they perceive the process as complex. PBC is typically proxied in the literature by variables such as the perceived probability of audit, the power of the tax authorities, the complexity of taxes, the availability of information about taxes, and awareness of taxes (Bobek & Hatfield 2003, Taing & Chang 2021).

PBC can influence behaviour both directly and indirectly through intentions. Importantly, PBC often explains a large part of the variation in intentions but much less of that in actual behaviour once intentions have been accounted for (Armitage & Conner 2001). Ajzen (1991) explains that PBC reflects perceived constraints on action, and its impact on intentions depends on the behaviour and the context. However, PBC does not necessarily correspond to actual control, and for that reason, actual control over performing a behaviour is often introduced as an additional factor in the literature on tax evasion.

Actual control. The original TPB does not include tax morale or actual control as formal components, and so they have been introduced as extensions in later adaptations of the model, particularly in applied contexts such as research into tax evasion (Weigel et al. 1987, Bobek & Hatfield 2003). In this strand of the literature, actual control refers to a person's real ability or capacity to perform a behaviour. It is sometimes included in the model alongside perceived behavioural control to capture the difference between subjective perceptions of control and actual opportunities to act.

Many papers on tax behaviour approach the issue as if taxpayers have full autonomy to choose whether to comply with tax or evade it. In real-life settings however, this choice is frequently constrained. Taxes for most individuals are paid directly by their employers, leaving little room for evasion and turning tax evasion into a set of occasional, low-stakes actions rather than a broad strategic decision (Hashimzade et al. 2013). People who are self-employed may find it easier than employees to evade taxes on both income and purchases, as they are generally not subject to third-party reporting and so tax evasion is more feasible for them. Empirical evidence consistently shows that underreporting is more common among the self-employed than among wage earners (Slemrod 2007, Kleven et al. 2011, Kukk et al. 2020). Taken together, this suggests that self-employment status provides a useful proxy for individuals' actual control over tax compliance decisions.

3. Dataset and variables

3.1 EMTA survey

We use data commissioned by the Estonian Tax and Customs Board under the Ministry of Finance that are taken from six waves of a survey conducted annually from 2018 to 2023. The data for 2024 are available but cannot be used for the reasons discussed below in Subsection 3.2. The goal of the survey is to capture the views of the public about the Estonian tax system, public services, and the Tax and Customs Board itself, and to measure the willingness of the public to pay taxes. For full details, see EMTA (2018, 2019, 2020, 2021, 2022, 2023, 2024); for a comprehensive overview of the data, see Levenko & Staehr (2023).

The target population of the survey is permanent residents of Estonia aged 15 to 74. The sample is selected using randomised quota sampling and covers around 1200-1300 respondents each year, in total around 7600 individuals over the six years. The survey combines Computer Assisted Web Interviewing (CAWI) and Computer Assisted Telephone Interviewing (CATI), with CAWI offering greater perceived anonymity, while CATI helps ensure the sample is representative by reaching groups that are less likely to respond online. We test for sampling adequacy and for the reliability of dataset using the Kaiser-Meyer-Olkin test and Cronbach's alpha (Taing & Chang 2021), while discriminant validity is assessed within the SEM framework.

3.2 Variables

The respondents were asked to evaluate the statements listed in Table T1 in the Appendix using a five-grade Likert scale with the response options "Strongly disagree", "Disagree", "Agree", and "Strongly agree", with "Neither agree nor disagree"/"Cannot estimate" as a backup option. For the analysis, we rearrange the order of responses placing "Cannot estimate" in the middle as the third option. Like previous studies, we give a cardinal interpretation to the Likert scale (Göb et al. 2007).

The responses are coded with values within [1, 2, 3, 4, 5]. Survey responses are grouped into several categories that correspond to the TPB factors. We use a separate group of five statements related to how the respondents perceive the work of the tax authorities (EMTA). Participants in the survey are asked to assess various attributes of the work of the EMTA on a seven-grade Likert-type scale with 1 corresponding to a negative assessment and 7 to a positive one. Questions are phrased like this: *How do you assess the work of the Tax and Customs Board? Do you think the Tax and Customs Board is…* The variable names and corresponding attributes are shown in Table T2 in the Appendix.

The main compliance variable used in the analysis captures the estimate by respondents the share of the Estonian population that pays taxes honestly. Respondents are asked to provide their estimate as a percentage. If a response is in the upper three quartiles of the distribution, meaning the respondent believes that 65 per cent or more pay their taxes honestly, the variable *general compliance* is coded 1, and otherwise it is 0. This threshold is chosen to ensure that the distribution of this variable is comparable to that of the self-reported compliance (see below). Alternative thresholds and the raw continuous measure are used as part of robustness checks.

The perceived share of the population that pays taxes honestly is used as a proxy for individual compliance, as prior research shows that perceptions of general compliance are strong predictors of personal tax behaviour. One explanation for this is interpersonal projection

bias, where individuals use their own behaviour as a heuristic when forming beliefs about others (Bushong & Gagnon-Bartsch 2024). A related concept is consensus bias, which is defined as the tendency to overestimate how common the respondent's own behaviours, attitudes or beliefs are among others (Krueger & Clement 1994). In this sense, reported perceptions of how much others comply are likely to reflect what the respondent considers normal or acceptable for their own behaviour.

An additional dependent variable is *self-reported compliance*. This is a binary variable equal to 1 for respondents who fully agree with the statement "*I always pay all the taxes correctly*" (68.4 per cent), and 0 is all the other options. We create an alternative measure of compliance labelled *compliance on time,* which is also binary and combines two statements. In this case, 1 is for those who strongly agree with the two statements about always being compliant and always paying taxes on time (62.5 per cent), and 0 is for all other combinations of answers.

The next three variables listed in Table T1, *income tax*, *tax incentives* and *excise tax*, are vignettes used for estimating the latent factor *intentions*. The vignette on income tax states: *Anti receives a cash bonus of 2000 euros at work at the end of the year. He assumes that since it is not recorded anywhere, the probability that the Tax and Customs Board will track it down is lower than average. If you were Anti, would you include this additional income on your income tax return?*[2]

The vignette on the misuse of tax incentives is phrased: *Sirje buys a car with a diesel engine. While researching fuel prices, she discovers that the price of special-purpose diesel is cheaper than regular diesel. She knows that it can only be used in agriculture, but she estimates that her chances of getting caught are low. If you were Sirje, would you fill up on special-purpose diesel?* The excise tax vignette runs: *Vello uses tobacco products every day and drinks strong alcohol every other week. He has the opportunity to buy these products through a random person for almost half the price of the nearest store. He is not sure about the exact contents of the products. If you were Vello, would you buy these products?*

Respondents to the income tax vignette are asked to provide a number from zero to 2000, while Sirje and Vello are assessed on five-grade Likert-type scale with the response options: "Always", "Often", "Seldom", "Only occasionally", and "Never". The three vignettes are used to generate binary variables with 1 corresponding to 2000 when Anti declares all his additional income, which 42.9 per cent of respondents say they would, or to "Never" for Sirje and Vello, reflecting intention to comply in full of 75.1 per cent for Sirje and 63.8 per cent for Vello.

[2] Unfortunately, in 2024 this vignette was rephrased in the following way: Anti receives a performance bonus in addition to his basic salary every month at work. This is transferred to his bank account. When he files his income tax return next year, he notices that his pre-filled income is only in the amount of his basic salary and that the performance bonus received during the year is not included. If you were Anti, would you include this additional income in your income tax return? The main difference is that now the bonus is not given in cash but is transferred to Anti's bank account. This rephrasing has substantially altered the distribution of responses (see Table T3 in the Appendix). While the share of compliant tax payers does not substantially differ from the 2018–2023 average at 69.8 per cent against 68.3 per cent, the share of those who would declare the entire bonus is larger by factor 1.6 at 70.3 against 43. For this reason, we have discarded the data for 2024 as this vignette is the key contributor to the intentions factor.

3.3 Summary statistics

Table 1 presents the means and standard deviations for the variables used in the analysis, together with their categorisation into observed variables and the latent factors to which they contribute. Tables T4.1 and T4.2 in the Appendix provide the full distribution of responses for the main variables used to construct the latent factors. The grouping of variables follows the structure of the theory of planned behaviour and is guided by both the existing literature discussed in Subsection 2.2 and the content of the survey questions.

Table 1. Summary statistics for the main variables

ID	Factor	Variable	Mean	St. dev.
C1	Compliance	Self-reported compliance	0.68	0.46
C2	Compliance	Compliance on time	0.63	0.48
C3	Compliance	General compliance	0.75	0.43
C4	Compliance	General (median)	0.47	0.50
C5	Compliance	General (4^{th} quantile)	0.25	0.43
C6	Compliance	General (continuous)	0.73	0.16
I1	Intentions	Income tax	0.43	0.50
I2	Intentions	Tax incentives	0.75	0.43
I3	Intentions	Excise tax	0.64	0.48
A1	Attitudes	Fairness of tax system	2.88	1.21
A2	Attitudes	Improved fairness of tax system	2.72	1.17
A3	Attitudes	Comprehensibility of tax system	3.16	1.24
A4	Attitudes	Taxation of harmful products	2.81	1.45
A5	Attitudes	Taxation of unhealthy products	3.59	1.45
A6	Attitudes	Important aims	3.09	1.43
A7	Attitudes	Provision of public services	4.27	1.00
A8	Attitudes	Satisfaction with public services	3.37	1.09
A9	Attitudes	Trust in government	2.83	1.26
E1	EMTA	Nonreliable – Reliable	5.55	1.37
E2	EMTA	Inefficient – Efficient	5.19	1.39
E3	EMTA	Rigid – Cooperative	4.51	1.68
E4	EMTA	Control – Advice	4.39	1.70
E5	EMTA	Unfair – Fair	4.73	1.75
N1	Norms (social)	Empirical expectations	4.22	0.84
N2	Norms (social)	Loss of respect	3.13	1.24
N3	Norms (social)	Normative expectations	3.83	1.05
M1	Norms (moral)	Important obligation	4.38	0.88
M2	Norms (moral)	Feeling bad if evade	3.84	1.26
M3	Norms (moral)	Disapprove shadow work	3.83	1.25
M4	Norms (moral)	Disapprove shadow purchases	3.57	1.30
P1	PBC (external)	Probability of audit	3.61	1.11
P2	PBC (external)	Ease of evasion	2.57	1.02
P3	PBC (internal)	Knowledge of paying taxes	4.15	0.98
P4	PBC (internal)	Knowledge of tax system	3.34	1.17
S1	Actual control	Being self-employed	0.08	0.28

Notes: Compliance (except for C6), intentions and actual control are binary variables; EMTA variables are coded with values within [1, 2, 3, 4, 5, 6, 7]; all other assessment variables are coded with values within [1, 2, 3, 4, 5]. EMTA refers to the attitudes towards the work of the Tax and Customs Board. PBC stands for perceived behavioural control.

The survey provides a wide range of socio-demographic information about respondents. We include in the analysis variables for the respondent's age, gender, nationality, place of residence, education level, and household size, and their assessment of their economic situation. We also include an indicator variable for the interview method. Summary statistics for the control variables are reported in Table T5 in the Appendix.

We use several tools to test for sampling adequacy and the reliability of the dataset. First, we test whether the assessment variables are suitable for factor analysis by applying the Bartlett test of sphericity with the null hypothesis that the variables are not intercorrelated, meaning the correlation matrix is an identity matrix. The test yields a chi-square statistic of 61887.9 with 325 degrees of freedom and a p-value of <0.001. Since the p-value is very small, we reject the null hypothesis, which suggests that the variables are sufficiently intercorrelated that we can proceed with further analysis.

Next, we use the Kaiser-Meyer-Olkin test as a diagnostic tool to test the suitability of the factor structure. The Kaiser-Meyer-Olkin measure of sampling adequacy is 0.89, which is considered very good and confirms that the correlations are strong and compact enough for factors to be extracted. The results suggest that the correlations of variables cluster into groups, which can be explained by the underlying latent factors. Each variable shares enough common variance with some other variables to justify combining them in a factor.

3.4 Allocation variables across latent factors

We model attitudes, subjective norms, perceived behavioural control, and their components as latent factors, effectively applying confirmatory factor analysis to the survey data. The main challenge in this approach is to allocate the available variables across the latent constructs. This allocation is guided by the existing literature and our understanding of the broader socio-psychological concepts underlying the TPB. The validity of this specification is then assessed formally.

In this paper, attitudes are modelled as perceptions of the existing tax system, including views on its fairness, comprehensibility, vertical reciprocity, and the necessity of Pigouvian taxes (see variables A1-A9 in Table 1). We also include in this factor trust in government, which has been shown to be important in explaining tax behaviour (Kirchler 2007). A separate group of attitudes captures assessments of the work of the tax authorities, such as whether it is perceived as fair, efficient, and supportive (variables E1-E5). Subjective norms, in their broadest interpretation, include variables capturing both peer pressure and intrinsic motivation to comply (see variables N1-N3 and M1-M4). Perceived behavioural control includes deterrence-related variables, such as the perceived probability of audit and the ease of tax evasion, as well as knowledge of how to comply with tax obligations. Actual control is modelled using an indicator variable of being self-employed.

The main distinction between attitudes and subjective norms can be understood in terms of how external these factors are to the respondent and how stable they are over time. Although both reflect individual perceptions, attitudes are primarily shaped by external factors as perceived by taxpayers, such as the characteristics of the tax system or public institutions. Subjective norms, by contrast, capture social expectations and moral considerations. In this sense, attitudes are more responsive to changes in the external environment, including laws, public services, and communication strategies of the tax authorities, whereas social norms, and especially tax morale, tend to be more deeply rooted and persistent over time (Torgler 2003, Torgler & Schaltegger 2006).

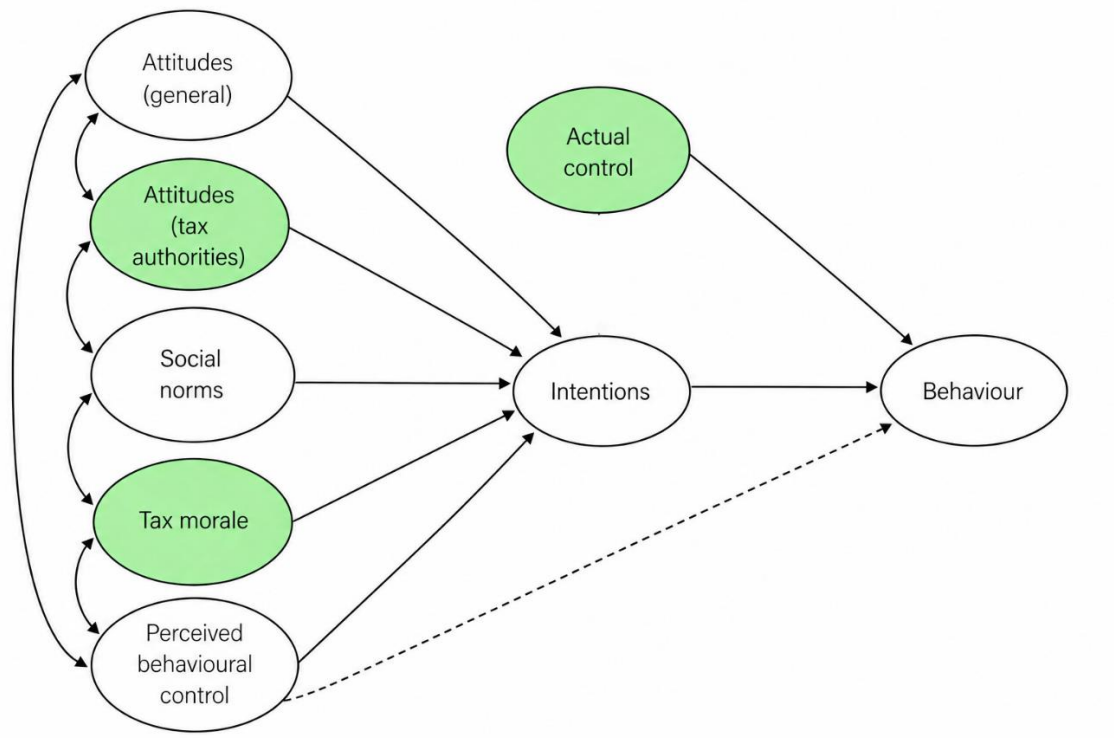

Figure 2. Augmented theory of planned behaviour

Notes: The diagram presents the TPB enhanced with three additional factors shown in green: attitudes towards tax authorities, tax morale, and actual control, where the latter is allowed to affect behaviour directly. The relationship of perceived behavioural control and behaviour is shown by a dashed arrow to indicate that this effect may be missing. Attitudes, norms, tax morale, and PBC are latent factors, while intentions, actual control, and behaviour are modelled as observed variables. Latent factors are allowed to correlate with each other.

After estimating a coarse baseline model that closely follows the TPB structure, we refine the specification by splitting broader factors into more narrowly defined components, see Figure 2. In particular, attitudes are divided into general attitudes and attitudes towards the tax authorities (EMTA), while subjective norms are split into a peer pressure component or social norms, and tax morale, which captures deeply rooted intrinsic motivation to comply with tax obligations. The PBC factor contains only four variables, and for this reason it is not split further, except in a robustness exercise.

We assess the validity of the allocation of variables across latent constructs by computing Cronbach's alpha; see Table T6 in the Appendix. Despite comprising multiple items, the alpha is high for broad attitudes (0.867), examined in the coarse specification (see Figure 1), and remains good or acceptable for its subcomponents, including general attitudes (0.806) and attitudes towards tax authorities (0.867). Further splitting general attitudes into subcomponents, such as reciprocity motives (0.674) and fairness-related perceptions (0.75), does not improve reliability. We therefore use either the broad measure of attitudes or a split into general attitudes and attitudes towards tax authorities (EMTA), as shown in Figure 2.

Reliability is also good for subjective norms (0.875), with both social norms (0.786) and moral norms (0.855) showing acceptable to good internal consistency. For perceived behavioural control (PBC), the alpha is low (0.458). Splitting PBC into external and internal components improves internal consistency for the latter (0.729), although it remains very low for the former (0.334). We use this split only in robustness analysis, as latent constructs based on only two variables may be unstable.

Finally, the alpha for intentions is relatively low (0.598), reflecting limited internal coherence across the three binary vignette-based measures. To address this, we do not combine these variables into a latent construct and instead treat them as observed variables, using the income tax vignette in the baseline specification, while the remaining vignettes are employed in robustness checks (see Subsection 4.3).

4. Estimation results

4.1 Baseline results

The TPB structure described in Subsection 2.2 is estimated within a structural equation modelling (SEM) framework using the weighted least squares mean and variance adjusted (WLSMV). This estimator is well suited for models with categorical variables, as it does not rely on the assumption of multivariate normality and provides robust standard errors. We begin by estimating a coarse specification that closely follows the original TPB framework, where tax morale is subsumed within subjective norms rather than modelled as a separate construct, and actual control is not explicitly incorporated.

One important extension of the analysis is modelling subjective norms as a mediator of attitudes. In this framework, attitudes are viewed as perceptions of tax system and public services shaped by the design of the tax system and the performance of tax authorities, which may in turn influence both social expectations and intrinsic motivation of respondents. This interpretation is consistent with the broader literature on trust and tax morale (Grube et al. 1986, Hashimzade et al. 2013). At the same time, allowing the latent factors to correlate captures potential mutual relationships between the constructs without imposing a strict causal ordering.

Table 2 reports the estimated structural relationships across four panels. The first panel presents the mediation equation estimated in columns (2) and (4). The second panel reports the intentions equation, showing how attitudes, subjective norms, and perceived behavioural control relate to compliance intentions. The third panel presents the compliance equation, where the coefficient on intentions captures the link between intentions to comply and actual behaviour. The lower panel reports goodness-of-fit measures and the number of observations. All coefficients are reported as standardised path estimates, with p-values in parentheses.

In Table 2, the compliance equation uses two dependent variables allowing us to assess whether the results are robust across different measures of the outcome: self-reported tax compliance (C1 in Table 1) in columns (1) and (2), and general compliance (C3) in columns (3) and (4). Intentions are modelled using the income tax vignette (I1) as an observed binary outcome. Columns (2) and (4) additionally include a mediation block capturing an indirect channel through which attitudes affect compliance intentions. All the specifications include the interview channel as a control variable in the compliance equation.

The variables compliance and intentions are observed, while attitudes, norms, and perceived behavioural control are modelled as latent factors estimated within the measurement component using observed indicators (see Table 1 and discussion in Subsection 3.4). It is important to note that the variable intentions is an endogenous variable that is jointly estimated within the structural model and enters the compliance equation directly, rather than being included as a predicted value from a separate first-stage regression.

Table 2. Baseline SEM results

	(1)	(2)	(3)	(4)
	Self-reported compliance	Self-reported + mediation	General compliance	General + mediation
Mediation model				
Attitudes → Norms		0.601		0.601
		(0.000)		(0.000)
Intentions model				
Attitudes	–0.072	–0.202	0.107	0.040
	(0.000)	(0.000)	(0.000)	(0.088)
Norms	0.532	0.582	0.355	0.378
	(0.000)	(0.000)	(0.000)	(0.000)
PBC	0.112	0.261	0.061	0.141
	(0.000)	(0.000)	(0.004)	(0.000)
Compliance model				
Intentions	0.763	0.763	0.568	0.567
	(0.000)	(0.000)	(0.000)	(0.000)
CFI	0.911	0.907	0.911	0.908
TLI	0.909	0.906	0.909	0.906
RMSEA	0.098	0.100	0.097	0.099
R2 intentions	0.309	0.349	0.214	0.224
R2 compliance	0.631	0.631	0.323	0.322
Number of observations	7597	7597	7597	7597

Notes: In columns (1) and (2), the dependent variable in the compliance equation is self-reported compliance (C1), and in columns (3) and (4), it is general compliance (C3). Coefficients are standardised, and p-values are reported in parentheses. The first panel presents estimates from the mediation model, where subjective norms mediate the effect of attitudes on intentions. The second panel reports results for the model with intentions as the dependent variable. The third panel presents results for the model with compliance as the dependent variable. The fourth panel reports the number of observations and goodness-of-fit measures, namely Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and R^2. Values of CFI > 0.9, TLI > 0.9, and RMSEA < 0.1 are typically considered acceptable.

All latent factors enter the equations with statistically significant and theoretically consistent positive signs, with one exception. The coefficient on attitudes in columns (1) and (2) is negative, suggesting that more favourable views of the tax system and public services are associated with lower compliance intentions and, through intentions, lower compliance behaviour. However, the magnitude of this effect is very small. In column (1), a one standard deviation increase in attitudes reduces the latent propensity to comply by about 0.04 standard deviations.

Once mediation through norms is accounted for, the total effect of attitudes on behaviour becomes positive (see column 2). The direct effect of attitudes on compliance is $-0.202 \times 0.763 = -0.154$, while the indirect effect through norms is $0.601 \times 0.582 \times 0.763 = 0.267$. The indirect effect therefore dominates, resulting in a strictly positive and non-negligible total effect. The magnitude of the total effect in column 2 (0.113) is close to that in column 4 (0.160), and in both cases, the indirect effect via norms outweighs the direct effect.

Subjective norms have the largest effect on intentions across all specifications, while the effects of attitudes and perceived behavioural control are substantially smaller. Intentions are a

stable predictor of actual behaviour, with magnitudes consistent with the existing literature (see for example Hanno & Violette 1996, Sheeran 2002). Overall, compliance intentions are primarily driven by subjective norms, while deterrence-related factors play a limited role. Positive attitudes are associated with higher compliance, mainly through their influence on tax morale and social norms. These patterns provide strong empirical support for the TPB framework as a useful representation of compliance behaviour.

To further assess the structure of the model, we examine whether the TPB factors can be meaningfully decomposed into subcomponents. Given the similarity of the estimates across specifications with different measures of compliance, and to keep the analysis closer to the theoretical structure, we drop the mediation extension and use the specification in column 3 as the starting point for the subsequent analysis. Table 3 reports the results.

Table 3. Extended SEM results with factor decomposition

	(1)	(2)	(3)	(4)	(5)
	Standard TPB	Split attitudes	Split norms	Add AC (baseline)	Add controls
Intentions model					
Attitudes	0.107	0.071	0.070	0.071	0.058
	(0.000)	(0.001)	(0.001)	(0.001)	(0.006)
EMTA		0.055	0.056	0.053	0.042
		(0.004)	(0.005)	(0.007)	(0.029)
Norms	0.355	0.350	0.147	0.145	0.153
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tax morale			0.229	0.227	0.216
			(0.000)	(0.000)	(0.000)
PBC	0.061	0.061	0.061	0.066	0.080
	(0.004)	(0.004)	(0.005)	(0.003)	(0.000)
Compliance model					
Intentions	0.568	0.567	0.567	0.564	0.525
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Actual control				–0.046	–0.057
				(0.003)	(0.000)
CFI	0.911	0.936	0.942	0.941	0.897
TLI	0.909	0.934	0.939	0.942	0.930
RMSEA	0.097	0.083	0.079	0.077	0.079
R2 intentions	0.214	0.215	0.215	0.214	0.201
R2 compliance	0.323	0.321	0.322	0.321	0.300
Number of observations	7597	7597	7597	7597	7597

Notes: The dependent variable is general compliance (C3). Coefficients are standardised, and p-values are reported in parentheses. The first panel presents estimates from the model with intentions as the dependent variable. The second panel reports estimates from the model with compliance as the dependent variable. The third panel shows goodness-of-fit measures and the number of observations. Values of CFI > 0.9, TLI > 0.9, and RMSEA < 0.1 are typically considered acceptable.

Attitudes in columns (2)-(5) are a subgroup of attitudes in column (1), where the latter includes both general attitudes and attitudes towards tax authorities (EMTA). Similarly, norms in columns (1) and (2) include both social norms and tax morale, while in columns (3)-(5) they include only social norms.

For the reader's convenience, column (1) of Table 3 repeats the results from column (3) of Table 2 using the most parsimonious specification. We then extend the model by splitting broad factors and incorporating additional variables. Column (2) separates attitudes into general attitudes and attitudes towards the tax authorities (EMTA). Column (3) decomposes norms into

social norms or peer pressure and moral norms or tax morale, interpreted as intrinsic motivation to comply. Column (4) introduces actual control over the ability to evade taxes in the compliance equation. Column (5) further adds control variables for age group, gender, nationality, and economic security.

The models reported in Table 3 show acceptable fit, indicating that the structural specification is consistent with the data.[3] Splitting the broad factors clearly improves model fit, see columns (2) and (3). By contrast, adding socio-demographic control variables in column (5) slightly reduces both the explanatory power of the compliance equation and the overall fit, suggesting limited additional explanatory value.

Augmenting the baseline TPB framework with an indicator of actual control, which is proxied by self-employment status, improves the model fit only marginally but is conceptually justified (Kukk et al. 2020, Weigel et al. 1987), suggesting that the objective opportunity to evade complements the intention-based mechanisms captured by the TPB. For the remainder of the analysis, we use the specification in column (4) as the baseline model, as it combines a good fit with a coherent theoretical structure.

Confirmatory factor analysis indicates that the measurement model is adequate. Standardised factor loadings and the correlations between the latent constructs are reported in Tables T7 and T8 in the Appendix. All the correlations between the TPB constructs are positive and statistically significant, but they remain below levels that would indicate substantial overlapping, supporting the discriminant validity of the constructs. Having confirmed the adequacy of the model fit and the validity of the measurement structure, we turn to the baseline results reported in column (4).

Tax morale and social norms emerge as the key determinants of compliance intentions, with tax morale having the strongest effect. This finding confirms that intrinsic motivation and perceived social expectations play a central role in shaping compliance behaviour and closely aligns with previous evidence based on the Estonian data (Levenko & Staehr 2023). Other factors play a more limited role. General attitudes and perceptions of the tax authorities (EMTA) have positive and statistically significant effects, although their magnitudes are relatively small. Perceived behavioural control is also positive and significant, but its contribution remains modest compared to subjective norms. In the compliance equation, intentions remain a strong and stable predictor of actual behaviour, with a substantial effect size.

4.2 Heterogeneity analysis

To explore heterogeneity in compliance behaviour, we introduce a novel approach for classifying taxpayers beyond the traditional framework of compliers and evaders, and we re-estimate the baseline model by splitting the sample into consistent and inconsistent taxpayers. A classification based on the intention-behaviour relationship has not been applied in the tax compliance literature, but appears in related behavioural research, see McBroom & Reed (1992), Orbell & Sheeran (1998).

[3] The three measures for goodness-of-fit reported in Table 2 are the Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA). CFI and TLI compare the estimated model with a null or independence model in which all the variables are assumed to be uncorrelated and only the variances are estimated. Values of CFI and TLI above 0.95 are typically interpreted as indicating excellent fit, while values between 0.90 and 0.95 are acceptable fit, and values below 0.90 are poor fit. For RMSEA, values below 0.05 indicate close fit, while values below 0.10 are generally considered acceptable.

The group of consistent taxpayers consists of respondents whose reported behaviour aligns with their intention to comply. They are the ones who report full compliance and no intention to evade, and those who consistently report both a willingness to evade and incomplete compliance. The group of inconsistent taxpayers comprises respondents whose reported intentions do not coincide with their behaviour. This includes individuals who report full compliance but indicate that they would evade tax if they could, and those who report occasional non-compliance despite expressing a willingness to comply. It is these *disinclined actors* and *inclined abstainers*, as labelled in the literature, that are responsible for the gap between intentions and behaviour (Sheeran 2002).

Following the extended specification in column (4) of Table 3, Table 4 reports the results of the heterogeneity analysis. The model is estimated separately for consistent and inconsistent taxpayers, using general compliance as the dependent variable in columns (2) and (3), and a continuous measure of general compliance (C6) in columns (4) and (5). Tables T9 and T10 in the Appendix report additional specifications for these subgroups, including models with split PBC and mediation.

Table 4. Consistent vs inconsistent taxpayers

	(1)	(2)	(3)	(4)	(5)
	Full sample	Consistent binary	Inconsistent binary	Consistent continuous	Inconsistent continuous
Intentions model					
Attitudes	0.071	–0.038	0.172	–0.047	0.195
	(0.001)	(0.158)	(0.000)	(0.081)	(0.000)
EMTA	0.053	0.040	0.034	0.046	0.052
	(0.007)	(0.129)	(0.268)	(0.076)	(0.074)
Norms	0.145	0.258	0.068	0.272	0.116
	(0.000)	(0.000)	(0.081)	(0.000)	(0.002)
Tax morale	0.227	0.422	0.013	0.401	–0.068
	(0.000)	(0.000)	(0.753)	(0.000)	(0.077)
PBC	0.066	0.140	–0.006	0.156	0.023
	(0.003)	(0.000)	(0.858)	(0.000)	(0.493)
Compliance model					
Intentions	0.564	0.514	0.465	0.436	0.404
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Actual control	–0.046	–0.070	0.001	–0.039	–0.020
	(0.003)	(0.001)	(0.967)	(0.010)	(0.165)
CFI	0.941	0.949	0.930	0.949	0.928
TLI	0.942	0.951	0.932	0.950	0.930
RMSEA	0.077	0.083	0.073	0.084	0.074
R2 intentions	0.214	0.536	0.055	0.540	0.069
R2 compliance	0.321	0.271	0.217	0.191	0.165
Number of observations	7597	3842	3755	3842	3755

Notes: See notes to Table 3. The estimates in column (1) are identical to those in Table 3, column (4). The model is estimated on the full sample in column (1) and on subsamples in columns (2)-(5). Columns (1)-(3) use general compliance (C3) as the dependent variable, while columns (4) and (5) use a continuous measure of compliance (C6).

For consistent taxpayers, whose intentions and behaviour align, general attitudes towards the tax system are either not statistically significant or only marginally significant, see columns (2) and (4). This suggests that their compliance choices are relatively stable and not directly driven

by general views about the tax system and public services. The mediation specification in Table T9 indicates that attitudes operate instead through subjective norms, affecting compliance intentions indirectly.

For the inconsistent group, in contrast, general attitudes are positive, large in magnitude, and highly significant, see columns (3) and (4). Attitudes towards the tax authorities are imprecisely estimated for both groups, although the effect is positive and similar in magnitude. The mediation results in Table T9 indicate that norms also transmit the effect of attitudes for inconsistent taxpayers, but the direct effect remains substantially stronger. These results indicate that institutional perceptions play a more prominent role in shaping compliance intentions for individuals whose behaviour and intentions do not align.

The opposite pattern emerges for social norms and tax morale. Social norms, and particularly tax morale, are strong predictors of compliance intentions for consistent taxpayers, but for the inconsistent group, tax morale is not significant, and the effect of social norms is substantially weaker. These results suggest that inconsistent taxpayers are driven less by internalised moral commitments and more by external considerations. This makes them more responsive to communication and enforcement strategies by the tax authority, as external factors are easier to influence than internal moral motivations.

Finally, perceived behavioural control and actual control in the compliance equation are not statistically significant for inconsistent taxpayers. This suggests that compliance decisions for this group are not strongly driven by the objective opportunity to evade tax. Their behaviour may instead be shaped more by attitudinal or contextual factors than by the actual possibility to pay less.

As an additional robustness check, we split PBC into internal and external components reflecting knowledge of how to pay taxes and deterrence-related factors such as the perceived probability of audit and ease of evasion (see Table T10). Consistent with earlier results, both components are significant for consistent taxpayers, while compliance intentions of inconsistent taxpayers are driven primarily by the deterrence-related component.

Overall, the results point to two distinct behavioural regimes: compliance among consistent taxpayers is primarily associated with internalised norms and moral motivations, while compliance among inconsistent taxpayers is more responsive to institutional factors. This pattern is consistent with the idea that different taxpayers rely on different behavioural mechanisms when forming compliance decisions. This finding is in line with the broader literature emphasising the role of tax morale and social norms in sustaining voluntary compliance (Kirchler et al. 2010).

As a part of the heterogeneity analysis, we also estimate the model separately for selected socio-demographic groups. We split the sample by gender, nationality (Estonian or other), education level (lower or higher), age group (young, middle-aged, or 50 and older), and self-reported economic security (coping poorly, adequately, or well). Prior research suggests that socio-demographic characteristics are generally weak predictors of tax compliance and do not substantially alter the main behavioural relationships (Bobek & Hatfield 2003). The results, reported in Tables T11 and T12 in the Appendix, are broadly consistent with the baseline specification. Although there are minor differences across groups, the overall model fit changes only marginally, and the estimated coefficients remain similar in magnitude and retain the same signs.

4.3 Robustness to measurement

Table 5 presents a sensitivity analysis using different proxies for the intentions variable. Column (1) reports the baseline results based on intentions related to income tax (I1), while columns (2) and (3) use proxies based on tax incentives (I2) and excise taxes (I3), and column (4) combines all three measures. Overall, the results and statistics for model fit are virtually identical across specifications.

Table 5. Sensitivity analysis: different proxies for intentions

	(1)	(2)	(3)	(4)
	Income tax (Baseline)	Tax incentives	Excise tax	All three
Intentions model				
Attitudes	0.071	0.044	0.073	0.058
	(0.001)	(0.041)	(0.000)	(0.007)
EMTA	0.053	0.100	0.119	0.074
	(0.007)	(0.000)	(0.000)	(0.000)
Norms	0.145	0.122	0.115	0.146
	(0.000)	(0.000)	(0.000)	(0.000)
Tax morale	0.227	0.194	0.172	0.250
	(0.000)	(0.000)	(0.000)	(0.000)
PBC	0.066	0.063	0.049	0.069
	(0.003)	(0.007)	(0.030)	(0.003)
Compliance model				
Intentions	0.564	0.588	0.563	0.560
	(0.000)	(0.000)	(0.000)	(0.000)
Actual control	–0.046	–0.046	–0.046	–0.046
	(0.003)	(0.003)	(0.003)	(0.003)
CFI	0.941	0.940	0.939	0.941
TLI	0.942	0.941	0.941	0.943
RMSEA	0.077	0.078	0.078	0.077
R2 intentions	0.214	0.180	0.179	0.242
R2 compliance	0.321	0.348	0.319	0.315
Number of observations	7597	7597	7597	7597

Notes: See notes to Table 3. The models reported here differ in the proxy used to construct the intentions variable. The estimates in column (1) are identical to those in Table 3, column (4), where intentions are measured with the income tax proxy (I1). In columns (2) and (3), intentions are measured using proxies related to tax incentives (I2) and excise taxes (I3) respectively, while column (4) combines all three proxies. The compliance equation remains unchanged across specifications and uses C3 as the proxy for compliance. All models are estimated on the full sample.

Table T13 in the Appendix reports estimates using alternative definitions of the compliance variable, including different thresholds (C4 and C5), a continuous measure (C6), and a binary indicator based on timely compliance (C2). The results remain very similar. Taken together, these findings indicate that the main results are robust to how compliance and intentions are measured.

We perform several additional robustness checks. We decompose attitudes into attitudes towards the fairness of the tax system and reciprocity motives; split the PBC into external and internal components as was done for the subsamples of consistent and inconsistent taxpayers; and allow perceived behavioural control to enter the compliance equation directly as illustrated by the dashed line in Figure 1. The results reported in Table T14 in the Appendix further

confirm that the main structural relationships remain robust to these alternative specifications. Most importantly, social norms and tax morale remain statistically significant and display effects of similar size in the intentions equation in all the specifications discussed above.

The results of this additional analysis indicate that perceptions of the fairness of the tax system are more important for compliance intentions than reciprocity considerations, as shown in column (2) of Table T14. With respect to perceived behavioural control, the external component is statistically significant, whereas the internal component is not, see column (3). This pattern reverses when self-reported tax compliance is used (results available upon request). Allowing PBC to enter the compliance equation directly reduces its role in the intentions equation and attenuates the coefficient on intentions. However, the explanatory power of the compliance equation declines markedly, indicating that this specification does not improve the model's ability to capture behaviour. This suggests that the role of PBC is not well identified as a separate direct effect and is more consistently captured through the intentions channel.

We also estimate several alternative specifications that include interaction terms between the main TPB components in order to explore potential nonlinearities and conditional relationships between key predictors. These included interactions between attitudes and tax morale, attitudes and social norms, actual control and tax morale, norms and tax morale, the two components of perceived behavioural control, and intentions and actual control in the compliance equation. While a few of the interaction terms were statistically significant in some specifications, their magnitudes were generally small and unstable across models, and they did not provide any new clear or theoretically meaningful insights. Importantly, the main results remain broadly unchanged when the interactions are included. For the sake of parsimony and space, these estimates are not reported, but they are available upon request.

5. Discussion of the results

This paper tests the predictive validity of the theory of planned behaviour by estimating the relationships between TPB factors and individual tax compliance behaviour. The results support the usefulness of the TPB framework in explaining tax compliance. By modelling the full structure linking attitudes, subjective norms, perceived control, intentions, and behaviour, the approach makes it possible to identify the underlying behavioural mechanisms. In particular, it allows mediating factors such as norms and intentions to be explicitly accounted for, which would be difficult to capture in more reduced-form approaches.

Across the various specifications and alternative measures of compliance and intentions, social norms and tax morale emerge as the most stable and powerful predictors of compliance intentions. This supports the normative component of the theory of planned behaviour and highlights the importance of moral motivation in the tax domain. Although these findings are not novel on their own, the robustness of the effects across specifications strengthens their credibility. The findings also suggest that applications of TPB to tax behaviour should explicitly incorporate tax morale, as omitting it may bias the estimated relationships.

The results indicate that attitudes influence tax compliance primarily through subjective norms. While the direct association between attitudes and compliance intentions is in some specifications negative, accounting for mediation reveals a positive overall effect. This reflects the fact that more favourable evaluations of the tax system shape individuals' perceptions of social expectations and their intrinsic motivation to comply, which in turn strengthen compliance intentions and behaviour. Thus, the influence of attitudes is primarily transmitted through norms and tax morale rather than exerted directly.

The finding that is most relevant for policy is the heterogeneity across taxpayers. Among consistent taxpayers whose intentions and behaviour align, compliance is primarily driven by moral commitment and perceived peer pressure, which are internal factors. Institutional attitudes play a minor role for them. For inconsistent taxpayers in contrast, attitudinal factors become substantially more significant. General attitudes towards the fairness of the tax system are strong predictors of intentions, while tax morale is of no importance. Interestingly actual control does not significantly affect behaviour in this group.

This pattern suggests that inconsistent taxpayers are guided less by internalised moral norms and are more responsive to perceptions of external institutions cues. From a policy perspective this group may therefore be particularly responsive to communication strategies, narratives about fairness, and trust-building measures, as their behaviour appears to react more strongly to external signals.

Overall, the results highlight the multi-dimensional nature of tax compliance and demonstrate the value of integrating social and psychological models into tax research. Future research could further explore taxpayer heterogeneity and examine how different groups respond to situational incentives and constraints.

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Appendix

Table T1. Main variables and corresponding survey statements

ID	Factor	Variable	Statement
C1	Compliance	Self-reported compliance	I always pay all the taxes correctly
C2	Compliance	Compliance on time	I always pay all the taxes correctly & I always pay all the taxes on time
C3-C6	Compliance	General compliance	Estimate the share of the Estonian population that pays taxes honestly
I1	Intentions	Income tax	Vignette on income tax, see text
I2	Intentions	Tax incentives	Vignette on tax incentives, see text
I3	Intentions	Excise tax	Vignette on excise tax, see text
A1	Attitudes	Fairness of tax system	The Estonian tax system is fair
A2	Attitudes	Improved fairness of tax system	Lately, the Estonian tax system has become fairer
A3	Attitudes	Comprehensibility of tax system	The Estonian tax system is easy to understand
A4	Attitudes	Taxation of harmful products	I support higher taxes on products that harm the environment
A5	Attitudes	Taxation of unhealthy products	I support higher taxation of products that cause harm to people's health
A6	Attitudes	Important aims	I could pay a bit more taxes if I could be certain that the money will be used for the aims that are important to me
A7	Attitudes	Provision of public services	I know that for the taxes I have paid I get some state-provided services
A8	Attitudes	Satisfaction with public services	I am satisfied with the public services in Estonia that I get for the taxes I pay
A9	Attitudes	Trust in government	I trust the Estonian government
N1	Norms (social)	Empirical expectations	Most of the people important to me declare their taxes correctly
N2	Norms (social)	Loss of respect	People important to me will not respect me if I do not pay my taxes correctly
N3	Norms (social)	Normative expectations	Most of the people important to me believe that it is important that I pay my taxes
M1	Norms (moral)	Important obligation	Paying taxes is an important obligation for me as a citizen
M2	Norms (moral)	Feeling bad if evade	I would feel bad if I did not pay my taxes
M3	Norms (moral)	Disapprove shadow work	People should not work in the shadow economy
M4	Norms (moral)	Disapprove shadow purchases	I do not approve if people buy goods cash-in-hand (without receipt)
P1	PBC (external)	Probability of audit	If someone does not declare their revenues, it is likely that EMTA will contact them
P2	PBC (external)	Ease of evasion	It is easy to evade paying taxes
P3	PBC (internal)	Knowledge of paying taxes	I know how to pay taxes
P4	PBC (internal)	Knowledge of tax system	My knowledge of the Estonian tax system is good

Note: PBC stands for perceived behavioural control. Compliance variables C3-C5 are constructed from a continuous measure of general compliance using different thresholds, while C6 is the raw continuous variable.

Table T2. Attitudes towards Tax Board variables and corresponding survey statements

ID	Variable	Statement
E1	Nonreliable – Reliable	Nonreliable – Reliable
E2	Non-efficient – Efficient	Non-efficient – Efficient
E3	Rigid – Cooperative	Rigid and bureaucratic – Cooperation-oriented
E4	Control – Advice	Focused on control and punishment – Focused on guiding citizens
E5	Unfair – Fair	Discriminatory toward citizens – Treating citizens equally

Note: Statements in this group were assessed on a seven-point scale, where higher values indicate a more positive assessment.

Table T3. Distribution of responses across survey waves

Year	Compliance =1	Income tax = 1
2018	71.1	39.3
2019	63.7	43.8
2020	63.8	47.4
2021	70.7	42.3
2022	69.9	43.9
2023	70.7	41.3
2024	69.8	70.3

Note: Reported willingness to comply (variable income tax) in 2024 is higher by factor 1.6 compared to the average in 2018–2023.

Table T4.1. Response frequencies of the assessment variables

ID	Variable	1	2	3	4	5
I1	Income tax	47.9	5.7	2.3	1.1	43.0
I2	Tax incentives	2.8	3.3	7.7	11.2	75.1
I3	Excise tax	5.3	7.7	10.0	13.2	63.8
A1	Fairness of tax system	13.8	31.9	13.0	34.8	6.5
A2	Improved fairness of tax system	17.8	27.9	24.3	24.7	5.4
A3	Comprehensibility of tax system	11.2	26.5	8.1	43.6	10.6
A4	Taxation of harmful products	23.3	30.5	3.5	26.9	15.8
A5	Taxation of unhealthy products	13.1	17.3	3.3	30.2	36.2
A6	Important aims	17.6	26.2	4.6	32.3	19.2
A7	Provision of public services	2.6	7.5	1.3	37.2	51.3
A8	Satisfaction with public services	6.2	20.4	11.9	52.9	8.6
A9	Trust in government	18.5	27.9	11.6	36.1	5.8
M1	Important obligation	1.9	4.7	1.3	38.0	54.1
M2	Feeling bad if evade	7.6	12.9	4.8	37.6	37.1
M3	Disapprove shadow work	6.9	13.7	5.3	38.0	36.1
M4	Disapprove shadow purchases	8.8	19.0	6.1	38.8	27.3
N1	Empirical expectations	0.9	2.8	12.9	40.6	42.8
N2	Loss of respect	12.6	18.6	27.7	25.8	15.3
N3	Normative expectations	3.6	7.5	20.7	38.9	29.3
P1	Probability of audit	4.4	14.7	17.7	41.9	21.3
P2	Ease of evasion	3.6	15.5	28.7	38.5	13.7
P3	Knowledge of paying taxes	2.1	9.1	1.5	46.4	40.9
P4	Knowledge of tax system	6.1	27.0	5.8	49.0	12.1

Note: The table reports the distribution of responses for the variables used to construct the latent factors. Respondents evaluate each statement on a five-point Likert scale ranging from "Strongly disagree" (1) to "Strongly agree" (5), with "Cannot estimate" as the middle category. The variables are grouped according to the TPB components, including attitudes (A), tax morale (M), social norms (N), and perceived behavioural control (P). The income tax vignette (I1) is transformed into a five-category scale to ensure comparability with the other variables

Table T4.2. Response frequencies of assessment variables (attitudes towards tax authoroties)

ID	Variable	1	2	3	4	5	6	7
E1	Nonreliable – Reliable	1.7	1.5	2.7	16.4	20.8	25.8	31.1
E2	Non-efficient – Efficient	2.2	1.7	4.3	22.6	25.2	23.3	20.6
E3	Rigid – Cooperative	7.5	5.3	9.1	29	19.7	15.1	14.4
E4	Control – Advice	9.1	5.4	9.5	29	19.9	14.7	12.5
E5	Unfair – Fair	7.5	4.2	7.3	27.4	16.3	16.6	20.6

Note: The table reports the distribution of responses for the variables measuring attitudes towards the Tax and Customs Board (EMTA). Responses are recorded on a seven-point Likert-type scale, where higher values indicate a more positive assessment. These variables are used to construct the latent factor capturing institutional attitudes in the SEM analysis

Table T5. Summary statistics for control variables

Variable	Value	Frequency	Unweighted	Weighted
Method of interview	CAWI	6023	79.3	77.6
	CATI	1574	20.7	22.4
Age group	15–24	832	11.0	13.0
	25–34	1423	18.7	18.3
	35–49	2222	29.2	28.3
	50–64	2092	27.5	26.1
	65–74	1028	13.5	14.3
Gender	Men	3655	48.1	48.8
	Women	3942	51.9	51.2
Nationality	Estonian	5311	69.9	67.5
	Other	2286	30.1	32.5
Place of residence	Outside Tallinn	5139	67.6	66.5
	Tallinn	2458	32.4	33.5
Education	Lower	4236	55.8	70.3
	Higher	3361	44.2	29.7
Family members	1	1361	17.9	18.0
	2	2716	35.8	34.9
	3	1495	19.7	19.8
	4	1301	17.1	17.3
	5 or more	724	9.5	10.1
Coping economically	Very badly	261	3.4	3.9
	Badly	819	10.8	11.5
	Ok	4043	53.2	54.3
	Well	1965	25.9	23.9
	Very well	509	6.7	6.3

Note: The table reports summary statistics for the control variables used in the analysis. “Frequency” denotes the number of observations, while “Unweighted” and “Weighted” columns report the corresponding shares in per cent. Weighted shares are computed using survey weights. CAWI stands for Computer Assisted Web Interviewing, and CATI for Computer Assisted Telephone Interviewing.

Table T6. Cronbach's alpha

Factor	Number of var-s	Cronbach's alpha	Comment
Intentions	3	0.598	Poor
Attitudes: broad	14	0.867	Good
Attitudes: general	9	0.806	Good
Attitudes: reciprocity	4	0.674	Borderline
Attitudes: fairness	5	0.750	Acceptable
EMTA (tax authorities)	5	0.867	Good
Subjective norms	7	0.875	Good
Norms (social)	3	0.786	Acceptable
Norms (moral)	4	0.855	Good
PBC	5	0.458	Poor
PBC external	2	0.334	Too low
PBC internal	2	0.729	Acceptable

Note: The table reports Cronbach's alpha for the survey items underlying each latent factor. The coefficients are computed using polychoric correlations to account for the ordinal nature of the response scales. Values above 0.7 are typically interpreted as acceptable reliability, while lower values suggest weaker internal consistency.

Table T7. Loadings of the variables behind first-order TPB constructs

Factor	Indicator	Loading	SE
Attitudes	Fairness of tax system	0.693	0.007
Attitudes	Improved fairness of tax system	0.569	0.008
Attitudes	Provision of public services	0.564	0.010
Attitudes	Satisfaction with public services	0.452	0.010
Attitudes	Important aims	0.356	0.011
Attitudes	Taxation of unhealthy products	0.437	0.011
Attitudes	Taxation of harmful products	0.471	0.010
Attitudes	Comprehensibility of tax system	0.573	0.009
Attitudes	Trust in government	0.528	0.009
EMTA	Nonreliable - reliable	0.787	0.006
EMTA	Non-efficient - efficient	0.702	0.006
EMTA	Rigid - cooperative	0.714	0.006
EMTA	Control - advise	0.650	0.007
EMTA	Unfair - fair	0.676	0.007
Norms	Normative expectations	0.703	0.007
Norms	Empirical expectations	0.604	0.009
Norms	Loss of respect	0.641	0.008
Tax morale	Important obligation	0.770	0.008
Tax morale	Feeling bad if evade	0.760	0.007
Tax morale	Disapprove shadow work	0.798	0.006
Tax morale	Disapprove shadow purchases	0.745	0.007
PBC external	Probability of audit	0.479	0.016
PBC external	Ease of evasion	0.145	0.016
PBC internal	Knowledge of tax system	0.549	0.012
PBC internal	Knowledge of paying taxes	0.709	0.013

Note: The table reports standardised factor loadings for the indicators of the first-order TPB constructs. The loadings are obtained from the baseline SEM specification reported in Table 3, column (4).

Table T8. Covariances among first-order TPB constructs

Construct 1	Construct 2	Correlation	SE
Attitudes (general)	EMTA	0.597	0.009
Attitudes (general)	Norms (social)	0.45	0.012
Attitudes (general)	Tax morale	0.58	0.01
Attitudes (general)	PBC	0.411	0.014
EMTA	Norms (social)	0.385	0.012
EMTA	Tax morale	0.507	0.01
EMTA	PBC	0.48	0.013
Norms (social)	Tax morale	0.73	0.008
Norms (social)	PBC	0.489	0.014
Tax morale	PBC	0.485	0.014

Note: The table reports pairwise latent factor correlations and their standard errors for the TPB constructs estimated in the baseline model, see Table 3, column (4).

Table T9. Consistent vs inconsistent taxpayers: mediation analysis

	(1)	(2)	(3)	(4)	(5)
	Full sample	Consistent binary	Inconsistent binary	Consistent continuous	Inconsistent continuous
Mediation model					
Attitudes → Norms	0.601	0.662	0.530	0.662	0.530
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Intentions model					
Attitudes	0.040	–0.178	0.165	–0.189	0.188
	(0.088)	(0.000)	(0.000)	(0.000)	(0.000)
Norms	0.378	0.702	0.086	0.702	0.064
	(0.000)	(0.000)	(0.001)	(0.000)	(0.012)
PBC	0.141	0.329	–0.004	0.347	0.020
	(0.000)	(0.000)	(0.901)	(0.000)	(0.530)
Compliance model					
Intentions	0.567	0.514	0.470	0.435	0.403
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Actual control		–0.070	0.001	–0.039	–0.020
		(0.001)	(0.965)	(0.010)	(0.165)
CFI	0.908	0.924	0.883	0.924	0.880
TLI	0.906	0.928	0.889	0.928	0.887
RMSEA	0.099	0.100	0.093	0.101	0.095
R2 intentions	0.224	0.584	0.049	0.591	0.057
R2 compliance	0.322	0.271	0.221	0.191	0.164
Number of observations	7597	3842	3755	3842	3755

Notes: See notes to Tables 2 and 4. Column (1) reproduces Table 2, column (4). The most coarse model specification with the mediation block is estimated for the subsamples. Columns (1)-(3) use the binary dependent variable (C3), while columns (4) and (5) use its continuous analogue (C6).

Table T10. Consistent vs inconsistent taxpayers: PBC split

	(1)	(2)	(3)	(4)	(5)
	Full sample	Consistent binary	Inconsistent binary	Consistent continuous	Inconsistent continuous
Intentions model					
Attitudes	0.082	-0.026	0.183	–0.028	0.212
	(0.000)	(0.336)	(0.000)	(0.302)	(0.000)
EMTA	0.045	0.031	0.024	0.031	0.037
	(0.024)	(0.253)	(0.423)	(0.252)	(0.209)
Norms	0.107	0.219	0.030	0.208	0.058
	(0.000)	(0.000)	(0.470)	(0.000)	(0.160)
Tax morale	0.238	0.429	0.024	0.413	–0.051
	(0.000)	(0.000)	(0.553)	(0.000)	(0.183)
PBC internal	0.021	0.098	-0.048	0.099	–0.047
	(0.232)	(0.000)	(0.085)	(0.000)	(0.079)
PBC external	0.107	0.131	0.088	0.178	0.149
	(0.000)	(0.000)	(0.007)	(0.000)	(0.000)
Compliance model					
Intentions	0.570	0.517	0.477	0.439	0.418
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Actual control	–0.046	–0.070	0.001	–0.039	–0.020
	(0.003)	(0.001)	(0.967)	(0.010)	(0.165)
CFI	0.947	0.955	0.937	0.955	0.935
TLI	0.948	0.955	0.938	0.955	0.936
RMSEA	0.074	0.079	0.070	0.079	0.071
R2 intentions	0.219	0.540	0.064	0.550	0.088
R2 compliance	0.327	0.274	0.228	0.194	0.176
Number of observations	7597	3842	3755	3842	3755

Notes: See notes to Tables 3 and 4. In this table, perceived behavioural control (PBC) is split into internal and external components, corresponding to knowledge-based and deterrence-based aspects of control. Columns (1)-(3) use the binary dependent variable (C3), while columns (4) and (5) use its continuous analogue (C6).

Table T11. Results by groups: age group and coping economically

	(1)	(2)	(3)	(4)	(5)	(6)
	Young	Middle	Adult	Badly	OK	Well
Intentions model						
Attitudes	0.260	0.018	0.043	0.016	0.052	0.110
	(0.000)	(0.559)	(0.208)	(0.772)	(0.058)	(0.002)
EMTA	–0.020	0.043	0.096	0.072	0.061	–0.002
	(0.717)	(0.135)	(0.002)	(0.160)	(0.025)	(0.956)
Norms	0.029	0.159	0.151	0.200	0.113	0.149
	(0.743)	(0.000)	(0.000)	(0.007)	(0.003)	(0.001)
Tax morale	0.244	0.301	0.154	0.162	0.246	0.244
	(0.010)	(0.000)	(0.000)	(0.030)	(0.000)	(0.000)
PBC	0.120	0.057	0.064	0.097	0.108	0.024
	(0.060)	(0.048)	(0.126)	(0.080)	(0.001)	(0.520)
Compliance model						
Intentions	0.572	0.493	0.643	0.631	0.541	0.467
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Actual control	–0.023	–0.052	–0.046	–0.087	–0.051	–0.036
	(0.611)	(0.018)	(0.056)	(0.021)	(0.014)	(0.186)
CFI	0.937	0.940	0.937	0.951	0.938	0.924
TLI	0.939	0.942	0.939	0.952	0.940	0.927
RMSEA	0.072	0.079	0.079	0.075	0.077	0.076
R2 intentions	0.283	0.242	0.171	0.200	0.224	0.201
R2 compliance	0.328	0.247	0.417	0.407	0.295	0.219
Number of observations	832	3645	3120	1080	4043	2474

Notes: See notes to Table 3. Young refers to a subsample of respondents of age 15–24; middle-aged are those of 25–49 years old; adult is 50 years old or older. Columns (4)–(6) refer to the distribution of responses to the question *How do you cope economically*?

Table T12. Results by groups: gender, nationality, education

	(1)	(2)	(3)	(4)	(5)	(6)
	Women	Men	Estonian	Other nationality	High education	Lower education
Intentions model						
Attitudes	0.039	0.098	0.110	0.009	0.019	0.106
	(0.172)	(0.001)	(0.000)	(0.818)	(0.540)	(0.000)
EMTA	0.020	0.096	0.030	0.097	0.043	0.056
	(0.483)	(0.001)	(0.190)	(0.012)	(0.154)	(0.031)
Norms	0.093	0.205	0.182	0.101	0.183	0.123
	(0.010)	(0.000)	(0.000)	(0.051)	(0.000)	(0.002)
Tax morale	0.282	0.154	0.186	0.273	0.250	0.204
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PBC	0.080	0.050	0.068	0.074	0.060	0.066
	(0.011)	(0.108)	(0.008)	(0.101)	(0.046)	(0.058)
Compliance model						
Intentions	0.535	0.609	0.569	0.554	0.515	0.588
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Actual control	–0.023	–0.068	–0.041	–0.060	–0.012	–0.080
	(0.281)	(0.002)	(0.025)	(0.027)	(0.609)	(0.000)
CFI	0.932	0.948	0.943	0.941	0.933	0.944
TLI	0.934	0.949	0.945	0.943	0.935	0.945
RMSEA	0.079	0.076	0.076	0.080	0.078	0.077
R2 intentions	0.189	0.241	0.221	0.215	0.215	0.207
R2 compliance	0.286	0.375	0.326	0.310	0.267	0.352
Number of observations	3942	3655	5311	2286	3361	4236

Notes: See notes to Table 3. The first two columns show differences in estimation across genders treated as a binary variable; columns (3) and (4) across Estonians and respondents of other nationalities; and columns (5) and (6) across respondents who obtained lower education and higher education.

Table T13. Sensitivity analysis: alternative dependent variables

	(1)	(2)	(3)	(4)
	Baseline	Median	4th quartile	Compliance on time
Intentions model				
Attitudes	0.071	0.044	0.031	–0.082
	(0.001)	(0.042)	(0.160)	(0.000)
EMTA	0.053	0.026	0.009	–0.002
	(0.007)	(0.204)	(0.661)	(0.900)
Norms	0.145	0.139	0.155	0.173
	(0.000)	(0.000)	(0.000)	(0.000)
Tax morale	0.227	0.250	0.271	0.384
	(0.000)	(0.000)	(0.000)	(0.000)
PBC	0.066	0.085	0.060	0.125
	(0.003)	(0.000)	(0.012)	(0.000)
Compliance model				
Intentions	0.564	0.419	0.358	0.726
	(0.000)	(0.000)	(0.000)	(0.000)
Actual control	–0.046	–0.020	–0.011	–0.133
	(0.003)	(0.170)	(0.505)	(0.000)
CFI	0.941	0.941	0.942	0.940
TLI	0.942	0.943	0.944	0.942
RMSEA	0.077	0.077	0.076	0.078
R2 intentions	0.214	0.209	0.209	0.305
R2 compliance	0.321	0.176	0.132	0.588
Number of observations	7597	7597	7597	7597

Notes: See notes to Table 3. The models reported here differ by the dependent variable used in the compliance equation. The estimates in column (1) are identical to those in Table 3, column (4), where C3 serves as the proxy for compliance (see Table 1 for variable definitions). In column (2), the dependent variable in the compliance equation is C4, while in column (3) it is C5. In column (4), the dependent variable is a binary measure based on self-reported timely compliance (C2). The models are estimated on the full sample.

Table T14. Sensitivity analysis: different specifications

	(1)	(2)	(3)	(4)
	Baseline	Split attitudes	PBC split	PBC direct
Intentions model				
Attitudes	0.071		0.082	0.051
	(0.001)		(0.000)	(0.024)
Attitudes: fairness		0.063		
		(0.052)		
Attitudes: reciprocity		0.008		
		(0.841)		
EMTA	0.053	0.054	0.045	0.010
	(0.007)	(0.007)	(0.024)	(0.657)
Norms	0.145	0.143	0.107	0.132
	(0.000)	(0.000)	(0.000)	(0.000)
Tax morale	0.227	0.230	0.238	0.313
	(0.000)	(0.000)	(0.000)	(0.000)
PBC	0.066	0.067		−0.021
	(0.003)	(0.003)		(0.437)
PBC internal			0.021	
			(0.232)	
PBC external			0.107	
			(0.000)	
Compliance model				
Intentions	0.564	0.565	0.570	0.170
	(0.000)	(0.000)	(0.000)	(0.000)
Actual control	−0.046	−0.046	−0.046	−0.046
	(0.003)	(0.003)	(0.003)	(0.003)
PBC (compliance)				0.377
				(0.000)
CFI	0.941	0.943	0.947	0.943
TLI	0.942	0.944	0.948	0.944
RMSEA	0.077	0.076	0.074	0.076
R2 intentions	0.214	0.214	0.219	0.199
R2 compliance	0.321	0.321	0.327	0.202
Number of observations	7597	7597	7597	7597

Notes: See notes to Table 3. The models reported here differ in their specification. The estimates in column (1) are identical to those in Table 3, column (4), where C3 serves as the proxy for compliance (see Table 1 for variable definitions and codes). Column (2) reports a split specification in which attitudes are decomposed into their fairness and reciprocity components. Column (3) splits PBC into internal and external subcomponents. In column (4), perceived behavioural control enters the compliance equation directly. All models are estimated on the full sample.

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Erwan Gautier, Cristina Conflitti, Daniel Enderle, Ludmila Fadejeva, Alex Grimaud, Eduardo Gutiérrez, Valentin Jouvanceau, Jan-Oliver Menz, Alari Paulus, Pavlos Petroulas, Pau Roldan-Blanco, Elisabeth Wieland. Consumer Price Stickiness in the Euro Area During an Inflation Surge

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