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MODELING TAXPAYER BEHAVIOR: AN EXPERIMENTAL ANALYSIS OF RESPONSES TO TAX GAME PARAMETERS

ABSTRACT

The article presents the results of an experimental study of the effects of audit probability, penalty levels, and moral-ethical motivation on taxpayers' behavior regarding the fulfillment of tax obligations. The aim of the study is to analyze the behavioral responses of participants in a laboratory experiment to changes in the parameters of a tax game that models' different regimes of monitoring, sanctions, and prosocial framing.

The research methodology is based on the principles of experimental economics and econometric modeling. Participants made decisions regarding tax compliance or tax evasion under various combinations of monitoring intensity and penalty severity, while the relationship between economic and behavioral factors and the choice of tax behavior strategies was analyzed using a binary choice logit model. A distinctive feature of the study is the implementation of two consecutive games: a control game, in which the collected funds had no social significance, and a morally oriented game, in which tax payments within the experiment were associated with a prosocial purpose for the use of funds, thereby creating a charitable framing effect. This approach made it possible to assess the potential influence of moral-ethical incentives on participants' financial behavior, although the obtained results may also partially reflect learning and adaptation effects.

The results indicate a predominantly adaptive and context-dependent nature of participants' decisions: the level of tax evasion increases under conditions of low audit probability and moderate penalties and decreases under stricter enforcement conditions. Behavioral differences were also identified between the control game and the game incorporating prosocial framing. The findings suggest that moral-ethical framing may affect different aspects of tax behavior in different ways. The impact of moral framing proved to be more pronounced at the level of the frequency of behavioral choices than at the level of the intensity of tax evasion.

The main theoretical conclusion is that tax behavior is shaped by the interaction of economic incentives, moral-ethical factors, and adaptive behavioral mechanisms. The findings indicate the potential role of behavioral factors in tax decision-making under laboratory experimental conditions; however, the limited sample size does not allow the results to be directly extrapolated to the broader population of taxpayers.

Keywords: tax policy, tax compliance, tax culture, tax evasion, moral-ethical framing, tax audit, penalties, behavioral economics, experimental economics, voluntary tax compliance

JEL Classification: H26, C91, D90, H20

INTRODUCTION

The sustainability of the tax system and the level of voluntary tax compliance remain key determinants of the effectiveness of state fiscal policy. Despite the formal clarity of tax rules, the actual behavior of taxpayers often deviates from expected norms, resulting in losses of budget revenues and a decline in trust in public institutions. The problem of tax evasion is multidimensional in nature, combining economic incentives, psychological attitudes, and socio-ethical norms that shape the motivation underlying financial behavior.

Under conditions of economic transformation, particularly in Ukraine, where the institutional strengthening of the tax system is ongoing, the study of behavioral aspects of taxation has become especially relevant. The state is increasingly combining fiscal and non-fiscal instruments to influence taxpayers; however, behavioral responses to such mechanisms remain insufficiently examined within controlled experimental models. An important role in the development of modern tax administration is also played by the digital transformation of public services, the use of big data, and digital platforms for interaction with taxpayers (OECD, 2024). The lack of experimentally validated evidence regarding the effects of audits, penalties, and moral incentives complicates the development of a balanced tax policy, thereby necessitating research into how changes in the parameters of monitoring, sanctions, and moral framing influence taxpayers' behavioral decisions.

LITERATURE REVIEW

Research on taxpayer behavior has evolved from classical rationalist models to modern behavioral and experimental approaches that account for socio-psychological determinants. One of the earliest attempts to formalize the process of tax evasion was the model proposed by M. Allingham and A. Sandmo (Allingham & Sandmo, 1972), which conceptualized evasion as a decision under risk: the taxpayer weighs the benefits of non-compliance against potential losses from fines, adjusted for the probability of detection. Despite its seminal contribution to the economic analysis of taxation, the model has been criticized for oversimplifying real-world taxpayer behavior and underestimating the role of moral-ethical and social factors in interactions between taxpayers and the state.

Subsequent studies have shifted the focus from theoretical modeling to empirical assessment of the effectiveness of governmental enforcement tools. The simulation study by N. Friedland, S. Maital, and A. Rutenberg (Friedland, Maital & Rutenberg, 1978) demonstrated that variations in audit probability and penalty magnitude do not always produce predictable changes in tax compliance, as perceptions of risk and trust in tax authorities play a critical mediating role. Field experiments by H. Kleven, M. Knudsen, C. Kreiner, S. Pedersen, and E. Saez (Kleven, Knudsen, Kreiner, Pedersen & Saez, 2011) confirmed that taxpayers' responses to enforcement depend on the informational context, accessibility of income data, and transparency of the tax system. Research by G. Fellner, R. Sausgruber, and C. Traxler (Fellner, Sausgruber & Traxler, 2009) further demonstrated that the effectiveness of tax administration strategies depends not only on the threat of sanctions but also on moral framing and social information, which can strengthen voluntary compliance with tax norms. These findings indicate that enhancing administrative efficiency requires a comprehensive approach extending beyond purely financial incentives. Comparative studies conducted by the OECD indicate that modern tax administrations are increasingly focused on risk-based enforcement, digital technologies, and enhancing the level of voluntary taxpayer compliance (OECD, 2025).

Contemporary research is increasingly focused on the behavioral aspects of tax compliance. Influenced by the work of D. Kahneman and A. Tversky (Kahneman & Tversky, 1979; Kahneman & Tversky, 1984), economists have begun to incorporate cognitive biases and social expectations into analyses of how individuals perceive risks and benefits. A significant contribution to the development of behavioral public finance was made by W. Congdon, J. Kling, and S. Mullainathan (Congdon, Kling & Mullainathan, 2011), who substantiated the need to apply behavioral economics to the design of public financial policy and tax regulation. The meta-analysis conducted by J. Alm and A. Malezieux (Alm & Malezieux, 2021) demonstrated that taxpayers' behavioral responses to penalties and enforcement depend on contextual factors and moral values, while the reviews by J. Andreoni, B. Erard, and J. Feinstein (Andreoni, Erard & Feinstein, 1998), as well as J. Slemrod and S. Yitzhaki (Slemrod & Yitzhaki, 2002), confirmed that increasing voluntary tax compliance is impossible without trust in government, fairness in the distribution of the tax burden, and transparency in budgetary policy.

An important direction in contemporary research on tax behavior is the concept of tax morale, which explains voluntary tax compliance not only through economic incentives but also through taxpayers' internal moral motivation. Unlike classical expected-utility models, this approach assumes that the willingness to fulfill tax obligations depends on the level of trust in government, perceptions of the fairness of the tax system, and prevailing social norms. Research by B. Torgler (Torgler, 2007) demonstrated that a high level of tax morale is positively associated with voluntary tax compliance even under conditions of relatively low enforcement intensity. The theoretical framework developed by T. R. Tyler (Tyler, 2006) likewise showed that voluntary compliance with the law largely depends on the legitimacy of public institutions, trust in authorities, and perceptions of the fairness of public policy. Within this perspective, tax behavior is viewed as the result of an interaction between economic incentives and institutional trust.

The development of behavioral economics has contributed to the emergence of a new approach to tax administration based on the use of behavioral interventions (behavioral nudges). According to OECD recommendations (OECD, 2021), moral appeals, social reminders, personalized messages, and other forms of behavioral influence that do not alter the

economic parameters of taxation can serve as effective tools for enhancing voluntary tax compliance. Unlike traditional enforcement instruments, behavioral interventions affect the way taxpayers perceive their own decisions and the social consequences of those decisions. In addition to behavioral interventions, modern tax administrations are increasingly employing artificial intelligence tools for risk analysis, the automation of enforcement activities, and the personalization of interactions with taxpayers (OECD, 2025).

At the same time, contemporary research demonstrates that voluntary tax compliance is determined not only by taxpayers' internal moral convictions but also by their perceptions of the legitimacy of public institutions. According to Tyler's (2006) theory of procedural justice, citizens are more likely to comply with legal requirements when they perceive public institutions as fair, reliable, and oriented toward the public good.

Within the framework of legitimacy theory, tax behavior is viewed not merely as the result of economic calculation or moral convictions but as a consequence of trust in government and perceptions of the social value of tax payments. Consequently, improvements in voluntary tax compliance may be achieved not only through increasing penalties or the probability of audits but also through fostering the belief that tax revenues are used for socially beneficial purposes.

A further development of behavioral approaches is associated with the slippery slope framework proposed by E. Kirchler, E. Hoelzl, and I. Wahl (Kirchler, Hoelzl & Wahl, 2008). According to this framework, the level of voluntary tax compliance is shaped by two key factors: the power of tax authorities and trust in tax authorities. Excessive reliance solely on coercive mechanisms may generate short-term increases in compliance; however, it may simultaneously weaken taxpayers' voluntary motivation in the long run. Thus, contemporary tax policy is increasingly viewed as a balance between enforcement and trust.

Within behavioral public finance, particular attention has been devoted to moral suasion – the use of moral, social, and ethical incentives to enhance voluntary tax compliance. Experimental studies demonstrate that information regarding the social importance of taxation, social responsibility, or the use of public funds for socially beneficial purposes can influence taxpayers' behavioral decisions even when the economic parameters of taxation remain unchanged. At the same time, the effectiveness of moral suasion remains heterogeneous and depends on taxpayers' individual characteristics, the level of trust in government, and the context of the experimental environment.

Experimental economics has made a significant contribution to the study of tax behavior. Laboratory tax games make it possible to model tax-related decisions in a controlled environment and to evaluate participants' responses to changes in enforcement intensity, penalties, informational framing, and moral incentives. The work of C. Camerer (Camerer, 2003) established the methodological foundations of behavioral game theory and the experimental analysis of strategic interactions among economic agents. A. Falk and J. Heckman (Falk & Heckman, 2009) substantiated the importance of laboratory experiments as one of the key sources of knowledge in the social sciences, while G. Charness, U. Gneezy, and M. Kuhn (Charness, Gneezy & Kuhn, 2012) systematized the methodological features of between-subject and within-subject experimental designs, which are widely employed in tax compliance research. Contemporary experimental studies of tax compliance indicate that taxpayer behavior is characterized by a high degree of contextual dependence and may change under the influence of prior experience, adaptation to risk, and the repeated nature of decision-making.

A separate stream of contemporary research is associated with the use of econometric methods to analyze taxpayers' behavioral responses. Applied studies of tax compliance widely employ binary choice models, panel data models, and methods for estimating the probability of tax evasion. The methodological foundations for the application of logistic regression, discrete choice models, and panel data analysis were developed in the works of J. Wooldridge (Wooldridge, 2010) and W. Greene (Greene, 2020). The use of these approaches makes it possible to assess the effects of penalties, audit probabilities, moral incentives, and socio-demographic characteristics on the likelihood of compliance with tax legislation, as well as to analyze the heterogeneity of taxpayers' behavioral responses.

In the works of Ukrainian scholars, research on modeling taxpayer behavior encompasses key issues related to tax morale, tax compliance, and institutional trust. In the monograph *Patriotism, Solidarity, and Fairness in Taxation* (Andrushchenko & Tuchak, 2022), V. L. Andrushchenko and T. V. Tuchak examine the ethical foundations of taxation, tax culture, and the role of fairness, solidarity, patriotism, and trust in government in shaping voluntary compliance with tax obligations. A. M. Sokolovska's monograph *The State Tax System: Theory and Practice of Its Formation* (Sokolovska, 2004) is devoted to the effects of tax burden, tax rates, sanctions, and enforcement mechanisms on taxpayer behavior, as well as to issues of tax evasion. A. I. Krysovatyi, in collaboration with H. V. Vasylevska (Krysovatyi & Vasylevska, 2013), investigates the influence of tax incentives and preferences on taxpayers' behavioral responses. In the monograph *Fiscal Space of Anti-Crisis Regulation*, T. I. Yefymenko (Yefymenko, 2012) examines fiscal trust, the legitimacy of the tax system, and the characteristics of taxpayer behavior under conditions of crisis-driven transformations.

Thus, the contemporary literature makes it possible to identify three interrelated groups of factors influencing tax compliance: economic incentives (penalties and audits), taxpayers' internal moral attitudes (tax morale), and perceptions of the social value of tax payments and the legitimacy of public institutions. One of the most promising directions for future research remains the analysis of moral-ethical framing as a behavioral intervention capable of influencing tax behavior without altering the economic parameters of the environment.

AIMS AND OBJECTIVES

The purpose of this study is to analyze the behavioral responses of participants in a laboratory experiment to changes in the parameters of a tax game designed to simulate different regimes of enforcement, sanctions, and prosocial framing. Within this framework, the study integrates theoretical modeling, laboratory experimentation, and binary choice econometric modeling to assess the effects of institutional, economic, and behavioral factors on the probability of voluntary tax compliance.

To achieve this objective, several interrelated tasks are undertaken. First, the study empirically tests the effects of government instruments – namely enforcement, penalties, and moral imperatives – on the behavioral responses of experimental participants. Second, it investigates the nature of participants' behavioral responses to changes in the parameters of government intervention using statistical analysis methods. A separate objective of the study is to analyze the dynamics of tax-related decisions across successive rounds of the experiment in order to identify learning effects, adaptation to risk, and the influence of prior experiences of successful or unsuccessful tax evasion on participants' subsequent decisions. Based on the findings obtained, practical recommendations are formulated for improving tax administration mechanisms and increasing the level of voluntary tax compliance. Unlike most previous studies, the present research is aimed not only at evaluating the effects of economic incentives but also at analyzing the interaction between economic and behavioral factors in the process of tax-related decision-making within a laboratory experimental setting.

METHODS

To test the hypothesis regarding the impact of audit probability, penalty severity, and moral-ethical motivation on taxpayers' compliance behavior, an experiment was conducted in the form of an economic game. The experimental design employed corresponds to the laboratory tax game approach widely used in contemporary behavioral public finance research to examine tax compliance under controlled conditions. The experimental design follows the principles of classical experimental economics, where taxpayer behavior is modeled as a function of the trade-off between the expected benefit of evasion and the subjective probability of detection and punishment.

This study employed the experimental method (to simulate taxpayer behavior under controlled conditions and to assess the impact of economic and moral-ethical factors on tax compliance), the method of mathematical modeling (to calculate the expected utility of taxpayers' decision to choose a tax evasion strategy), methods of analysis and synthesis (to generalize the experimental results and identify patterns between economic parameters and the participants' actual behavior), descriptive statistical methods (for the primary summarization of participants' behavioral responses), as well as econometric binary choice methods, specifically logit modeling, to evaluate the influence of economic, institutional, and behavioral factors on the probability of choosing a strategy of full tax compliance.

To formally test whether participants' actual behavior corresponded to economically rational strategies, an additional comparative analysis was conducted between the sign of the expected value of tax evasion and participants' actual decisions in each round of the experiment. An evasion strategy was considered rational in cases where the expected value was positive ($EV > 0$), whereas a strategy of full tax payment was considered rational when the expected value was negative ($EV < 0$).

The study employed three levels of expected value interpretation. EV_{1UAN} was used as a characteristic of the incentive structure of an individual round; $EV_{decision}$ represented the expected outcome of a participant's specific decision; and $EV_{participant}$ and EV_{game} served as aggregated measures of the expected outcomes of participants' behavior. This distinction makes it possible to avoid conflating the characteristics of the experimental environment with the actual behavior of participants.

To formalize the behavioral patterns underlying tax-related decisions, a binary-choice logit model was employed. The dependent variable was the probability of choosing a strategy of full tax compliance: a value of "1" was assigned to cases of full tax payment, while a value of "0" was assigned to cases of partial payment or tax evasion. The explanatory variables

included the probability of a tax audit, the magnitude of the penalty, the expected value of gains from tax evasion, the moral-ethical framing of the experiment, participants' risk propensity, gender, investment experience, and prior experience with tax evasion.

To examine potential heterogeneity in the effects of prosocial framing, additional models were estimated that included interaction terms between the indicator for the second game and participants' individual characteristics (gender, risk propensity, investment experience, and prior tax-evasion experience). None of the corresponding interaction coefficients reached statistical significance at conventional significance levels. Therefore, the results do not support the existence of systematic heterogeneity in the effects of prosocial framing across the specified participant groups.

To test the statistical significance of behavioral changes between the first and second games, McNemar's test was additionally employed, as it is designed for the analysis of paired binary samples. The test made it possible to assess the statistical significance of changes in the frequency with which participants selected the strategy of full tax compliance under the two experimental conditions.

Given the repeated nature of the observations and the presence of multiple decisions made by the same participant, a logit model with cluster-robust standard errors at the participant level was also employed, making it possible to account for within-individual correlation across repeated decisions.

The econometric analysis was conducted using the R software environment (version 4.4.0). The functions of the stats package were used to estimate the logit model, while the sandwich and lmtree packages were employed to calculate participant-level clustered standard errors. All model parameters were estimated using the maximum likelihood method.

Since each participant made decisions across several rounds, the observations exhibit a panel structure and are not fully independent. To ensure the correct estimation of the statistical significance of the logit model coefficients, cluster-robust standard errors at the participant level were applied, allowing for the consideration of within-individual correlation in repeated decisions.

The experiment employed a within-subject design in which all participants sequentially took part in two games. The order of the conditions was fixed and was not randomized. This approach ensured the comparability of behavioral responses among the same participants; however, it also created a potential risk of behavioral adaptation effects, experience accumulation, and changes in subjective risk perception. In the experimental economics literature, such phenomena are commonly referred to as repeated decision-making effects and may affect the stability of participants' behavioral responses throughout the game. Accordingly, the findings regarding moral-ethical framing should be interpreted as preliminary and associative rather than as definitive evidence of a causal effect of moral motivation on tax behavior.

To distinguish the effect of moral-ethical framing from learning and experience accumulation effects, an additional analysis of the inter-round dynamics of participants' decisions was conducted. For each decision, the outcome of the previous round was classified into one of three behavioral situations: successful tax evasion (obtaining a financial benefit without detection of the violation); detection of the violation and imposition of sanctions; or full tax compliance. The subsequent analysis made it possible to assess how these events influenced the probability of repeated tax evasion in the following round. This approach is consistent with the concepts of experience-based learning and belief updating in behavioral economics and allows for the investigation of the adaptive nature of tax behavior.

Participants in the experiment were recruited voluntarily from among university students. Recruitment was conducted through an open invitation to participate in the study without the use of coercion or administrative pressure. Prior to the beginning of the experiment, participants were informed about the general conditions of the game, the rules governing decision-making, and the principles for processing the obtained results.

The experiment included a financial incentive component: participants received real monetary payments, and their financial outcomes depended on the decisions they made during the game as well as the results of tax audits. This approach made it possible to approximate the experimental conditions to real-world economic decision-making under risk as closely as possible.

All participant responses and results were anonymized, and the collected data were used exclusively in aggregated scientific form without the possibility of identifying specific individuals.

The study was conducted in accordance with the fundamental ethical principles of voluntary participation, confidentiality, and data anonymity. Participation in the study involved no psychological pressure, concealed influence, or risks to participants. Individuals aged 17 participated voluntarily within the framework of an educational and research experiment that did not involve intrusion into private life or the collection of sensitive personal data.

It is important to note that the audit and penalty parameters used in the experiment do not replicate the specific institutional mechanisms of real-world tax administration. Rather, they are employed as experimental incentives designed for modeling purposes.

The experiment was designed primarily to identify behavioral associations rather than causal effects of moral-ethical framing. Since the prosocial framing condition was always implemented after the control condition, and participants were not randomly assigned to alternative sequences of experimental conditions, the observed differences between Game 1 and Game 2 may reflect a combination of framing effects, learning effects, behavioral adaptation, and accumulated experience. Accordingly, all findings related to moral-ethical framing should be interpreted as associative rather than causal.

RESULTS

Twenty individuals between the ages of seventeen and twenty participated in the study. The research sample was experimental in nature and was formed according to the principle of participant availability. The study involved university students, which limits the possibility of directly extrapolating the obtained results to the general population of taxpayers. Accordingly, the findings should primarily be interpreted as indicative behavioral patterns observed within a laboratory experiment involving a youth audience. Certain behavioral characteristics were analyzed within small participant subgroups (based on gender, investment experience, prior experience with tax evasion, and level of risk propensity). Given the limited sample size, the results of intergroup comparisons should be interpreted as indicative behavioral trends rather than statistically representative characteristics of the broader taxpayer population.

Before the start of the experiment, all participants received a standardized written instruction. The instruction stated that in each round they would be assigned a tax liability of UAH 10 and would independently determine the amount of tax they wished to pay. Participants were informed of the values of the tax audit probability and the penalty rate applicable in each round. They were also informed that, in the event of an audit, any unpaid tax amount would be collected together with a penalty in accordance with the rules of the game. Participants were prohibited from discussing their decisions with one another during the experiment. Prior to the first round, all participants were given an opportunity to ask clarifying questions regarding the rules of the game.

The study involved twenty participants aged seventeen to twenty. At the beginning of the experiment, each participant received UAH 200, representing the total amount of the nominal taxable income to be paid to the budget (two games consisting of ten rounds each, with a tax liability of UAH 10 per round). In each round, participants received a tax declaration form specifying the amount of tax due (UAH 10 per round), the audit probability (the probability of being selected for tax inspection), and the penalty rate in case of detected evasion. Each participant independently determined the actual amount of tax to pay – choosing between full payment, partial payment, or complete evasion.

If tax evasion was detected during an audit, the participant was required to pay both the unpaid tax and a fine calculated as the product of the unpaid amount and the penalty rate. Thus, each participant's expected payoff depended on the combination of their individual risk perception, the experimental parameters (audit probability and penalty rate), and the moral-ethical factors introduced in the second phase of the experiment.

Participant selection for tax audits was conducted independently in each round through random number generation. For each participant, after the submission of a tax declaration, a random number between 0 and 100 was generated. If the generated value did not exceed the audit probability established for the respective round, the participant was selected for a tax audit. The audit procedure was independent across both participants and rounds, ensuring compliance with the predetermined audit probability parameters and eliminating the possibility of strategic prediction of audit outcomes.

At the beginning of the experiment, each participant received an initial endowment of UAH 200, which was used to make tax payments and cover any potential penalties. Upon completion of all rounds, the participant's final financial outcome was calculated. Any remaining balance was paid to the participant in cash (or transferred to a bank card). In the second game, all amounts paid as taxes were allocated to charitable purposes after the completion of the experiment, in accordance with the conditions announced prior to the start of the experiment.

The experiment consisted of two consecutive games involving the same participants. This approach made it possible to ensure comparability of behavioral responses within a single participant sample; however, it also created the potential for learning effects, adaptation to the experimental conditions, and changes in risk perception between the first and second games. The first game served as a control experiment without any moral framing: all collected funds were returned to the experiment organizers. Participants were therefore purely motivated by personal gain, aiming to minimize their tax payments to maximize profit. The second game, in contrast, incorporated a moral-ethical component. Prior to its session,

participants were informed that all funds collected in the role of the “state” would be donated to charity. Consequently, tax evasion acquired not only a financial but also a moral dimension, as paying taxes in this context was equated with charitable giving.

In terms of economic parameters, both games were identical: audit probabilities and penalty rates were replicated across all ten rounds, allowing for direct comparison of behavioral differences driven exclusively by the moral-ethical component rather than structural variations in the environment (Table 1).

Table 1. Conditions of each game by round.

| Game Round Number | Initial Conditions | | |
|-------------------|-------------------------------|---|--------------------------|
| | Amount of Tax Liability (UAH) | Penalty Rate for Nonpayment (% of Unpaid Tax Liability) | Probability of Audit (%) |
| 1 | 10 | 67 | 60 |
| 2 | 10 | 500 | 10 |
| 3 | 10 | 25 | 25 |
| 4 | 10 | 80 | 70 |
| 5 | 10 | 234 | 30 |
| 6 | 10 | 500 | 20 |
| 7 | 10 | 50 | 50 |
| 8 | 10 | 250 | 40 |
| 9 | 10 | 25 | 80 |
| 10 | 10 | 1000 | 5 |

This approach provided an opportunity for a comparative analysis of participants’ behavioral responses across two experimental contexts. At the same time, the differences between the results of the first and second games cannot be interpreted solely as the consequence of moral-ethical influence, since participants’ behavior may also have been affected by learning effects, adaptation to the mechanics of the game, prior experience of successful or unsuccessful tax evasion, as well as changes in risk perception resulting from repeated participation in the experiment.

To gain deeper insight into the experimental results, a survey was conducted among the participants (Appendix A). The questionnaire included demographic characteristics (age, gender) as well as several behavioral variables – investment experience, risk tolerance (measured on a 10-point scale), and the presence or absence of prior experience in tax evasion. The majority of participants were female (70%), with an average age of 18.8 years. Approximately one-fourth of respondents reported having investment experience, while over one-third admitted to previous instances of tax evasion, interpreted broadly. The average risk tolerance across the sample was 6.3 points, corresponding to a moderate level of risk-taking.

The sample thus represents a young, economically active population inclined toward experimentation in financial decision-making. This characteristic provided a suitable foundation for comparing the experimental findings with real-world taxpayer behavior, where both rational expectations of economic benefit and subjective moral-ethical beliefs jointly determine the degree of voluntary tax compliance.

Descriptive Statistics of the Experimental Results

To ensure conciseness of presentation and focus on the key patterns, the individual results of participants are provided in Appendices B and C. Their overall statistical characteristics are presented in Table 2.

Table 2. General statistical characteristics of the experimental results.

| Indicator | The value of the indicator | |
|--|----------------------------|--------|
| | Game 1 | Game 2 |
| Number of decisions | 200 | 200 |
| Number of cases of full tax compliance | 72 | 89 |
| Frequency of full tax compliance, % | 36.0 | 44.5 |
| Tax evasion rate, % | 64.0 | 55.5 |
| Average tax payment, UAH | 6.765 | 6.625 |

The analysis indicates that in the second game, which incorporated prosocial framing, the rate of full tax compliance was higher by 8.5 percentage points (from 36.0% to 44.5%). At the same time, the average amount of taxes paid decreased slightly. These differences suggest that prosocial framing was associated primarily with differences in the frequency of choosing the full tax compliance strategy rather than with differences in the intensity of tax evasion. However, the study design does not allow for a clear separation of the potential framing effect from the effects of learning and participant adaptation.

It should be emphasized that the actual financial results of participants depended not only on their behavioral choices regarding tax payments but also on the random selection of individuals subjected to tax audits. Therefore, the observed outcome represents one of many possible alternative scenarios.

From an analytical perspective, it is appropriate to interpret the results along two complementary dimensions: Analyzing economic outcomes through the lens of the expected value (mathematical expectation) derived from taxpayers' behavioral strategies; Characterizing the decision-making process itself – specifically, the choice to comply with or evade taxation.

The expected value of tax evasion under the conditions of the experiment was calculated using the following formula:

$$EV_y = x(1 - a) - x * a * b, \quad (1)$$

where EV_y – expected value of tax evasion; x – amount of unpaid tax liability (UAH); a – probability of audit (decimal value); b – penalty rate (decimal value).

To distinguish different levels of analysis in the study, three interrelated expected value indicators are used. The first level is the expected value of non-payment of one hryvnia of tax liability:

$$EV_{1UAN} = (1 - a) - a * b, \quad (2)$$

where EV_{1UAN} is the expected value of evading the payment of one hryvnia of tax liability.

This indicator characterizes the economic attractiveness of tax evasion regardless of the actual amount of unpaid tax and reflects the parameters of the experimental environment (audit probability and penalty size). Specifically, EV_{1UAN} is used to classify experimental rounds as economically favorable or unfavorable for tax evasion.

The expected value of a participant's specific decision depends on the actual amount of unpaid tax:

$$EV_{decision} = x[(1 - a) - a * b], \quad (3)$$

where $EV_{decision}$ is the expected value of a participant's specific decision.

Thus, $EV_{decision}$ reflects the expected financial outcome of a particular act of tax evasion.

The third level of analysis is represented by aggregated expected value indicators. For each participant and for each game, the sum of the expected values of all decisions made was calculated:

$$EV_{participant} = \sum EV_{decision}, \quad (4)$$

where $EV_{participant}$ is the aggregated expected value indicator.

Aggregating individual results makes it possible to assess the overall expected financial effect of tax behavior within a particular game or across the experiment as a whole:

$$EV_{game} = \sum EV_{participant}, \quad (5)$$

where EV_{game} is the overall expected financial effect of tax behavior within a particular game.

Unlike EV_{1UAN} , which characterizes environmental parameters, the aggregated indicators reflect the actual behavior of experimental participants.

The formulas presented above make it possible to quantitatively assess the taxpayer’s expected gain or loss from tax non-payment under different combinations of audit probability and penalty magnitude. They allow modeling an economically rational individual response to the risk of being detected in cases of tax evasion.

The underlying logic assumes that a taxpayer compares the potential benefit from non-payment ($x(1-a)$) with the expected loss if detected (xab). When the expected value is positive ($EVt > 0$), evasion becomes economically advantageous, thereby increasing the likelihood of non-compliance. Conversely, when $EVt < 0$, the expected losses outweigh the potential gains, reducing the motivation to evade taxes.

For each round, the unit-level expected value (EV_{1UAN}) was calculated to characterize the economic attractiveness of tax evasion independently of the actual amount of unpaid tax. Full calculations are provided in Appendix D. Among the ten experimental scenarios, tax evasion was economically advantageous in four cases ($EV > 0$), economically disadvantageous in five cases ($EV < 0$), and in one case the expected outcome was neutral.

The comparison between theoretically rational behavior and the actual behavior of experiment participants is presented in Table 3.

Table 3. Comparison of theoretically rational and actual behavior of experiment participants. Notes: EV_{1UAN} characterizes the economic attractiveness of tax evasion, determined exclusively by the parameters of the experimental environment and independent of the actual amount of unpaid tax; compiled by the authors.

| Round | Unit-level EV (EV_{1UAN}) from non-payment of UAH 1 | Theoretically Rational Strategy | Share of Participants Who Evaded Taxes, % | Share of Decisions Consistent with the Rational Strategy, % |
|-------|---|---------------------------------|---|---|
| 1 | -0,002 | Full compliance | 35.0 | 65.0 |
| 2 | 0,400 | Tax evasion | 82.5 | 82.5 |
| 3 | 0,6875 | Tax evasion | 87.5 | 87.5 |
| 4 | -0,260 | Full compliance | 35.0 | 65.0 |
| 5 | -0,002 | Full compliance | 65.0 | 35.0 |
| 6 | -0,200 | Full compliance | 70.0 | 30.0 |
| 7 | 0,250 | Tax evasion | 57.5 | 57.5 |
| 8 | -0,400 | Full compliance | 50.0 | 50.0 |
| 9 | 0,000 | Neutral zone | 35.0 | – |
| 10 | 0,450 | Tax evasion | 82.5 | 82.5 |

The dynamics of the share of participants who engaged in tax evasion across experimental rounds are presented in Figure 1.

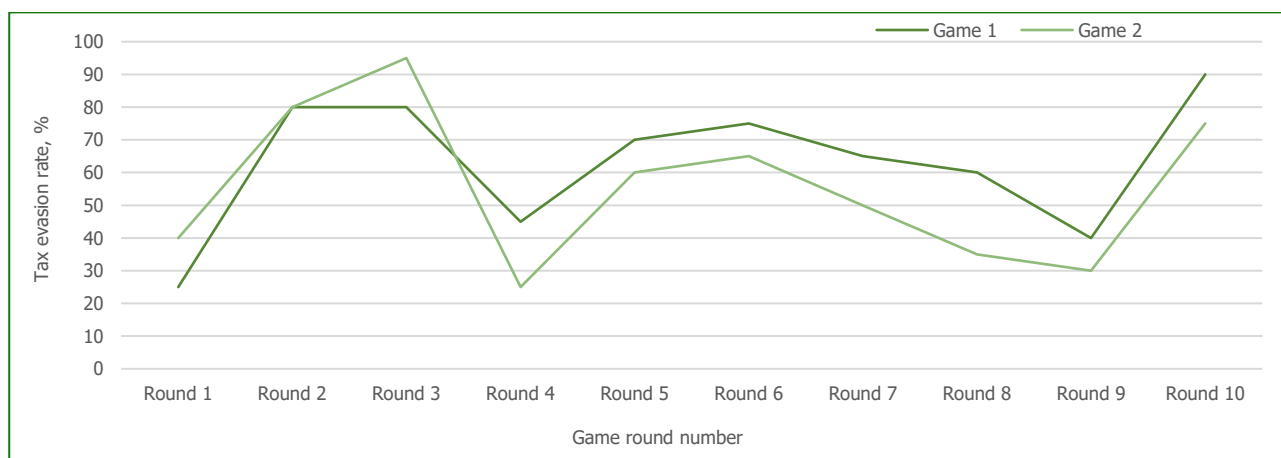


Figure 1. Dynamics of tax evasion.

Figure 1 shows that both games exhibit substantial fluctuations in the level of compliance depending on penalty parameters and audit probability. At the same time, no systematic trend toward either an increase or decrease in the level of tax evasion is observed.

To evaluate not only the occurrence of tax evasion but also its intensity, the average amount of unpaid taxes in each round was analyzed (Figure 2).

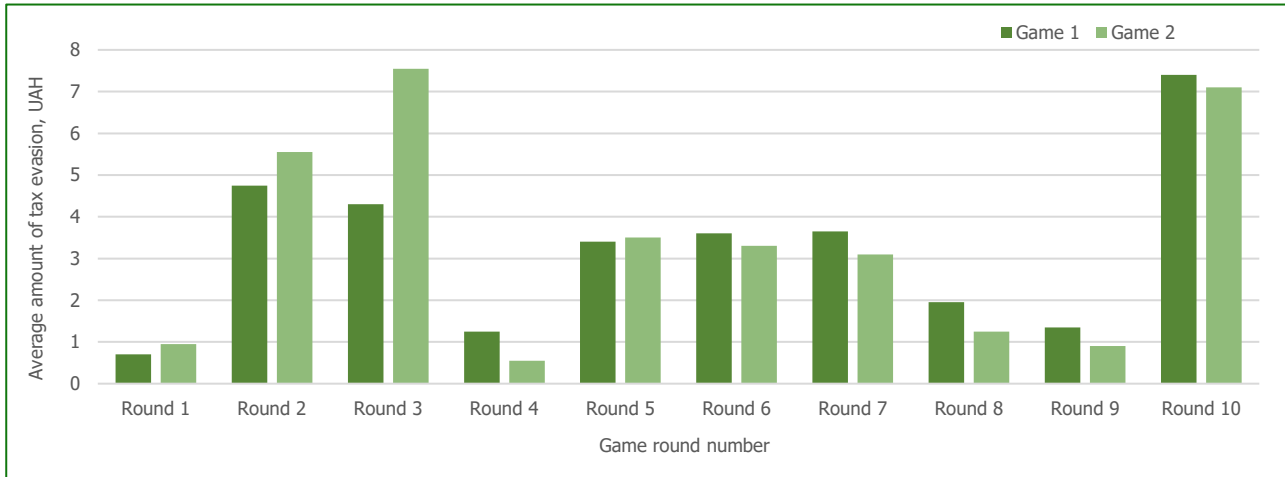


Figure 2. Dynamics of the average magnitude of tax evasion.

The results presented in Figure 2 demonstrate that the dynamics of the average magnitude of tax evasion do not always correspond to the dynamics of evasion frequency. In several rounds, a reduction in the number of participants who evaded taxes was not accompanied by a proportional decrease in the amount of unpaid taxes. This suggests that moral and ethical framing may have primarily influenced decisions regarding whether to violate tax obligations at all, while having a weaker effect on the amount of unpaid tax among those participants who nevertheless chose an evasion strategy.

Inferential Statistical Analysis.

To test the statistical significance of changes in tax behavior between the first and second games, McNemar’s test for paired observations was applied (χ^2 McNemar = 3.606; p-value = 0.058). The obtained results indicate a statistically significant association between participation in the second game, which incorporated prosocial framing, and a higher level of tax compliance. At the 10% significance level, the null hypothesis of no change is rejected.

To assess the impact of the experimental parameters on the probability of full tax payment, a logit model was estimated, in which the dependent variable was the full payment of the tax liability. The results are presented in Table 4.

Table 4. Results of the logit model assessing the impact of experimental parameters on the probability of full tax payment. Notes: The Game 2 variable reflects participation in the second experimental phase, which simultaneously included prosocial framing and accumulated gameplay experience. Therefore, the coefficient cannot be interpreted as the pure effect of moral framing. Compiled by the authors.

| Indicator | The value of the indicator | | |
|-------------------|----------------------------|------------|---------|
| | Coefficient | Odds Ratio | p-value |
| Audit probability | 0.044 | 1.045 | <0.001 |
| Penalty | 0.001 | 1.001 | 0.118 |
| Game 2 | 0.416 | 1.516 | 0.061 |
| Round | -0.030 | 0.971 | 0.515 |

It is important to note that the coefficient of the Game 2 variable should not be interpreted as the causal effect of prosocial framing. Since all participants sequentially completed the control game first and then the morally oriented game, the Game 2 variable simultaneously captures the influence of the prosocial context, accumulated experience, behavioral adaptation, and potential learning effects. In the absence of randomization or a counterbalanced design, the results allow only the identification of statistical associations between participation in the second phase of the experiment and participants’ tax behavior.

The probability of an audit had the strongest impact on tax behavior. An increase in the audit probability by one percentage point increase the odds of full tax payment by approximately 4.5%.

Additional analysis of the heterogeneity of behavioral responses involved estimating interaction effects between the Game 2 variable and individual participant characteristics. Specifically, interactions between prosocial framing and gender, risk propensity, investment experience, and prior tax evasion experience were examined. The results did not reveal any statistically significant interaction effects. This suggests that there is no empirical evidence to support the claim that prosocial framing systematically affected specific socio-demographic groups of participants differently within the study sample.

The marginal effects analysis (Table 5) indicates that an increase in the audit probability by 10 percentage points is associated with an approximately 9-percentage-point increase in the probability of full tax payment.

| Indicator | Marginal effect |
|-------------------|-----------------|
| Audit probability | 0.009 |
| Penalty | 0.0002 |
| Game 2 | 0.085 |
| Round | -0.006 |

To test the hypothesis regarding the presence of learning effects or adaptation to the experimental conditions, the round number variable was included in the model (Round coefficient = -0.030 ; p -value = 0.515).

No statistically significant effect of the round number on the probability of full tax payment was detected. Therefore, the obtained results do not provide sufficient evidence to support the existence of learning effects or behavioral adaptation effects.

Behavioral Interpretation of the Results.

The calculation of aggregated expected value indicators (the sum of *EVdecision* across all participant decisions) (Appendix E) made it possible to derive the following general conclusions.

1. The analysis of the results demonstrated that the assessment of tax behavior depends on the indicator used. When the number of instances of incomplete tax payment is employed as the measure, a reduction in the frequency of tax evasion is observed in the game with moral-ethical framing. This finding is consistent with the concept of tax morale (Torgler, 2007), according to which intrinsic moral motivation may serve as an independent determinant of voluntary tax compliance. At the same time, the analysis of the actual amounts of unpaid taxes and the expected value of gains from tax evasion presents a considerably less clear-cut picture. This suggests that moral framing is associated with changes in decisions regarding the very occurrence of tax evasion, but does not necessarily affect the magnitude of such evasion to the same extent. Therefore, assessing the effectiveness of moral incentives requires simultaneous consideration of both the frequency and the intensity of tax violations.
2. In most cases, the second game exhibited a higher average level of tax evasion compared to the first game. This indicates that a change in the moral context does not necessarily lead to a proportional reduction in the volume of tax evasion. From the perspective of legitimacy theory, this result may suggest that directing tax payments toward charitable purposes enhanced participants' perception of the social value of taxation. In this context, the fulfillment of tax obligations may have been viewed by participants not only as a financial duty but also as a form of contribution to socially significant goals. Some participants may have refrained from minor forms of tax evasion, while others continued to pursue riskier strategies involving larger amounts of unpaid taxes. As a result, changes in the frequency of behavior do not always translate into corresponding changes in aggregated financial indicators. Furthermore, the observed difference is associated with a change in the experimental context, which included moral-ethical framing; however, it cannot be unambiguously interpreted as a direct consequence of the moral stimulus due to the potential influence of learning effects, adaptation effects, and the accumulation of prior experience.
3. To formally test the correspondence between participants' actual behavior and economically rational strategies, the sign of the expected value of tax evasion was compared with the actual share of evasion decisions in each round of the experiment (see Table 3).

The obtained results indicate that the general behavioral tendency of the participants is consistent with the basic economic logic of the Allingham–Sandmo model: in rounds with a positive expected value of evasion (Rounds 2, 3, 7, and 10), the majority of participants chose strategies involving nonpayment or partial payment of taxes. The highest levels of evasion were observed in Rounds 2, 3, and 10, where the share of corresponding decisions ranged from 82.5% to 87.5%.

At the same time, the experimental results do not allow participants' behavior to be interpreted as fully rational in the classical economic sense. In several rounds with a negative expected value of evasion (in particular, Rounds 5, 6, and 8), relatively high levels of tax evasion were also recorded, ranging from 50% to 70% of decisions. This suggests that a substantial proportion of participants either underestimated the expected losses associated with penalties or overestimated the probability of avoiding a tax audit.

Such behavior is consistent with the approaches of behavioral economics, according to which individuals make decisions under conditions of bounded rationality and subjective risk perception. Therefore, the experimental findings indicate not absolute rationality in tax behavior, but rather a combination of economic incentives with psychological and behavioral distortions in risk assessment.

4. When comparing average values across players, it can be assumed that the moral factor exerted an asymmetric effect. The analysis of individual behavioral trajectories revealed substantial heterogeneity in participants' responses to moral-ethical framing. The moral-ethical framing employed in this study may also be interpreted as a form of behavioral nudge. According to contemporary OECD recommendations, such interventions alter the decision-making context without changing economic incentives and can enhance voluntary tax compliance by strengthening taxpayers' moral and social motivations.

Overall, the expected value of actual tax evasion volumes confirms the basic economic logic: taxpayers evade when it is profitable and comply when the expected losses outweigh the potential gains. However, the results indicate that changes in participants' behavior may be associated not only with economic incentives but also with the moral-ethical context of decision-making. At the same time, the research design used does not allow for a complete separation of the effects of moral framing from those of repeated participation in the experiment. Within the framework of the conducted experiment, the introduction of a moral-ethical component was accompanied by increased heterogeneity in participants' behavioral responses. At the same time, given the sequential nature of the two games, the observed changes cannot be interpreted unequivocally as a direct consequence of the moral stimulus, since part of the effect may have been shaped by participants' adaptation to the experimental environment.

The analysis of participant behavior dynamics across successive rounds (Table 6) indicates the presence of moderate behavioral inertia. Following successful tax evasion, participants chose the non-compliance strategy again in 64.3% of cases. After a violation was detected and a penalty was imposed, the frequency of repeated evasion was 63.6%, only slightly lower. In contrast, after full tax payment, the probability of subsequent tax evasion decreased to 60.4%.

Table 6. Effect of the previous round outcome on the probability of tax evasion in the subsequent round.

| Outcome of the Previous Round | Number of Observations | Number of Repeated Evasion Cases | Probability of Repeated Evasion, % |
|---|------------------------|----------------------------------|------------------------------------|
| Successful tax evasion (benefit obtained) | 140 | 90 | 64.3 |
| Violation detected and penalty imposed | 66 | 42 | 63.6 |
| Full tax payment | 154 | 93 | 60.4 |
| Total | 360 | 225 | 62.5 |

Thus, the direct experience of financial losses resulting from a tax audit did not lead to a radical change in participants' behavior. This suggests that, under laboratory experimental conditions, decisions were determined to a greater extent not by the outcome of the immediately preceding round, but rather by the overall perception of the risk structure and the expected benefits.

An analysis of the effect of prior experience on subsequent decisions across the individual games (Table 7) demonstrates a substantial change in behavioral responses. In the first game, the probability of repeated tax evasion exceeded 67% regardless of the outcome of the previous round. This indicates the predominance of economic motivation and the desire to maximize individual financial outcomes.

Table 7. Effect of prior experience on subsequent decisions across individual games.

| Outcome of the Previous Round | First Game, % of Repeated Evasion | Second Game, % of Repeated Evasion |
|-------------------------------|-----------------------------------|------------------------------------|
| Successful tax evasion | 67.6 | 60.6 |
| Violation detected | 69.4 | 56.7 |
| Full tax payment | 67.1 | 54.8 |

In the second game, the frequency of repeated tax evasion decreased across all participant groups. The most pronounced reductions were observed following the detection of a violation (from 69.4% to 56.7%) and following full tax payment (from 67.1% to 54.8%). These results indicate that the second game, which combined prosocial framing with the effects of accumulated experience, was associated with a lower frequency of repeated tax evasion.

The data characterizing the decision-making process itself demonstrate that the choice to pay or not to pay taxes is not a static personal trait but rather a context-dependent behavior, shaped by specific conditions and environmental parameters that define the interaction between the taxpayer and the state.

No participant paid taxes in all rounds of both games, indicating the absence of complete tax discipline even under controlled conditions. Most players demonstrated adaptive behavior, responding to changes in audit probability, penalty levels, and expected gains, which is consistent with the assumption that participants are sensitive to changes in expected economic benefits. At the same time, deviations from pure economic logic point to the influence of non-material factors – moral, psychological, and social motives.

A distinct group of participants consistently evaded taxes throughout all rounds, acting according to a conscious strategy of utility maximization, perceiving the risk of sanctions as acceptable. This indicates the existence of a type of economic agent with a stable propensity for non-compliance.

A comparison of the results from the two games reveals behavioral differences between the control game and the game incorporating prosocial framing. In the first game, tax evasion was recorded in 129 out of 200 cases, whereas in the second game it was observed in 111 cases, representing a 14% reduction in frequency. To test the statistical significance of changes in the frequency of choosing the strategy of full tax compliance between the two games, McNemar’s test for paired binary samples was applied. The test results demonstrated a statistically significant change in participants’ behavior between the first and second games ($\chi^2 = 5.16$; $p = 0.023$). This indicates that the introduction of the moral-ethical framing was associated with a statistically significant increase in the frequency of full tax payment decisions. However, given the sequential nature of the games, the observed effect cannot be interpreted exclusively as a causal consequence of moral motivation, since it may partially reflect participants’ adaptation to the experimental conditions.

Thus, the results of the experiment indicate a possible relationship between moral incentives and a reduction in the intensity of tax evasion. Nevertheless, the identified effect should be interpreted cautiously, taking into account the potential influence of the sequence of the games, the accumulation of experience, and participants’ behavioral adaptation.

At the same time, different indicators of tax behavior demonstrated heterogeneous dynamics. A decrease in the frequency of evasion cases was not always accompanied by a proportional reduction in the volume of unpaid amounts or in the expected gains derived from evasion. Accordingly, the effect of the moral-ethical stimulus should be interpreted differentially depending on the type of behavioral indicator considered.

The overall evasion rate across both games reached 60% (Figure 3), indicating the predominance of tax evasion strategies among participants. Most individuals, even when aware of the possibility of an audit, were willing to evade taxes as long as the expected benefit remained positive or near zero.

The dynamics of evasion by rounds reveal a distinct dependence on the experimental conditions. In rounds with low audit probability and mild penalties, the frequency of evasion rose significantly, whereas in rounds with high audit intensity and severe sanctions, it declined. This supports the validity of the classical Allingham–Sandmo model (Allingham & Sandmo, 1972), according to which taxpayers act as rational agents responding to variations in the risk of punishment.

However, the results also show that even under identical economic parameters, the level of evasion fluctuated across rounds, reflecting the impact of additional psychological factors such as risk habituation, the previous-win effect, or moral fatigue from repeated decision-making.

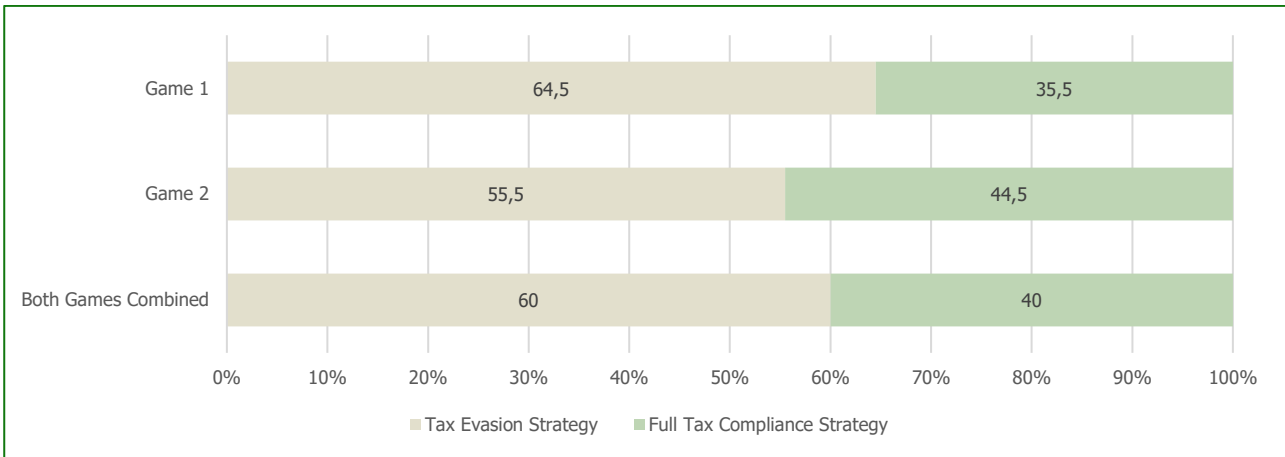


Figure 3. Structure of participants' tax payment decisions.

An analysis of the decision structure by rounds (Figure 4) indicates that participants' behavior was adaptive: they adjusted their strategies according to changes in audit probability, penalty size, and ethical game conditions.

The experimental findings provide an in-depth understanding of the decision-making process related to tax evasion, reflecting not only the quantitative aspects of strategic choice but also its psychological, behavioral, and socio-economic determinants.

An analysis of tax compliance strategy levels across different dimensions – gender, investment experience, prior behavior, and risk tolerance – makes it possible to identify typical behavioral patterns and the key factors influencing individual tax decisions.

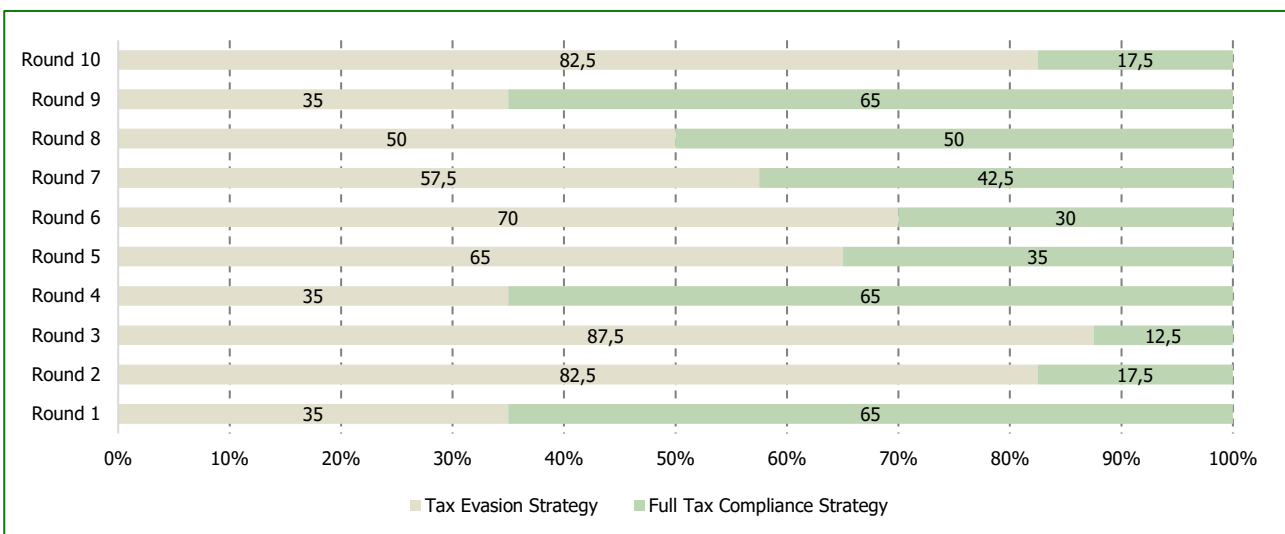


Figure 4. Structure of participants' tax payment decisions by game round.

The results of the experimental study provide a deeper understanding of the characteristics of the decision-making process regarding tax evasion, reflecting not only the quantitative parameters of strategy choice but also the psychological, behavioral, and socioeconomic determinants underlying this process. An analysis of the rates of choosing the strategy of full tax payment across different dimensions – gender, investment experience, prior behavior, and risk propensity – makes it possible to identify typical behavioral patterns and the factors influencing individuals' tax decisions.

First and foremost, it should be noted that the decision to pay or evade taxes constitutes a complex cognitive act that combines rational calculations with emotional and moral judgments. According to the experimental results, the average rate of choosing the strategy of full tax payment across both games ranged from 30% to 55%, demonstrating substantial variation among participant groups (Table 8). This indicates that tax decisions are not universal but are shaped by individual characteristics, including experience, risk propensity, and ethical orientations.

Table 8. Behavioral heterogeneity of tax compliance responses to moral-ethical framing. Notes: Full Tax Payment Rate (FTPR) denotes the rate of choosing the strategy of full tax payment. Compiled by the authors based on Appendices F and G.

| Group | Full Tax Payment Rate (Game 1), % | Full Tax Payment Rate (Game 2), % | Δ (percentage points) |
|----------------------------------|-----------------------------------|-----------------------------------|-----------------------|
| Men | 32.0 | 54.0 | +22.0 |
| Women | 36.6 | 41.4 | +4.8 |
| Investment experience | 30.0 | 52.5 | +22.5 |
| No investment experience | 36.9 | 41.9 | +5.0 |
| Prior tax evasion experience | 48.4 | 53.3 | +4.9 |
| No prior tax evasion experience | 30.0 | 40.7 | +10.7 |
| Low risk propensity (4 – 5) | 50.0 | 61.7 | +11.7 |
| Moderate risk propensity (6 – 7) | 31.1 | 40.3 | +9.2 |
| High risk propensity (8 – 9) | 35.0 | 18.4 | -16.6 |

The data presented in Table 8 indicate a heterogeneous impact of moral-ethical framing on the tax behavior of experimental participants. The largest increases in the rate of full tax payment were observed among men (+22.0 percentage points) and participants with investment experience (+22.5 percentage points). In contrast, the changes were considerably less pronounced among women and participants without investment experience.

Particular attention should be paid to the effect of individual risk propensity. For participants with low and moderate levels of risk appetite, moral-ethical framing contributed to an increase in tax compliance, whereas among individuals with a high propensity for risk, a decline in the rate of voluntary tax payment was observed. These findings point to the existence of behavioral heterogeneity in responses to moral incentives and are consistent with the propositions of behavioral economics regarding the differing sensitivity of various groups of taxpayers to non-monetary factors.

To test the statistical significance of the influence of economic and behavioral factors on the tax decisions of experimental participants, a binary choice logit model was constructed. The use of the logit approach was determined by the dichotomous nature of the dependent variable, which reflected the choice between full tax compliance and partial or complete tax evasion.

Within the model, the dependent variable represented full tax compliance: the value “1” corresponded to cases of full payment of the tax liability, while the value “0” corresponded to cases of partial payment or complete tax evasion. The independent variables included the level of tax enforcement, the magnitude of penalties, the expected value of gains from tax evasion, the moral-ethical framing of the experiment, participants’ individual risk propensity, as well as respondents’ socio-behavioral characteristics.

The specification of the logit model is as follows:

$$P(Y_i = 1) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 A_i + \beta_2 P_i + \beta_3 EV_i + \beta_4 M_i + \beta_5 R_i + \beta_6 I_i + \beta_7 E_i + \beta_8 G_i)}} \quad (6)$$

where, $P(Y_i = 1)$ – probability of choosing the strategy of full tax compliance; A_i – probability of a tax audit; P_i – penalty level; EV_i – expected value of gains from tax evasion; M_i – moral-ethical framing of the experiment; R_i – level of risk propensity; I_i – presence of investment experience; E_i – presence of prior experience with tax evasion; G_i – gender of the experimental participant; β – coefficient.

To estimate the logit model, a dataset was constructed at the level of individual participant decisions in each round of the experiment. Since 20 participants took part in two games consisting of 10 rounds each, the resulting dataset contained 400 observations (20 × 20). Each observation corresponded to a single decision made by a specific participant in a specific round.

The dependent variable took the value of 1 in cases of full payment of the tax liability and 0 in cases of partial payment or tax evasion. Participants’ individual characteristics (gender, risk propensity, investment experience, and prior tax evasion experience) were replicated across all observations associated with the respective participant, whereas the experimental environment variables (audit probability, penalty level, expected value of tax evasion, and moral framing) varied according to the conditions of the specific round.

Due to the repeated observations for each participant, standard errors were estimated using clustering at the individual level (20 clusters). The coding of the variables is presented in Appendix H.

The results of the logit model of participants' tax behavior are presented in Table 9.

Table 9. Results of the logit model of experimental participants' tax behavior. Notes: A – probability of a tax audit; P – penalty level; EV – expected value of gains from tax evasion; M – moral-ethical framing of the experiment; R – level of risk propensity; I – presence of investment experience; E – presence of prior experience with tax evasion; G – gender of the experimental participant; compiled by the authors.

| Variable | Coefficient | Std. Err. | p-value | Odds Ratio |
|-----------|-------------|-----------|---------|------------|
| Intercept | 0.5927 | 1.0848 | 0.5848 | 1.8089 |
| A | 0.0362 | 0.0116 | 0.0018 | 1.0368 |
| P | 0.0005 | 0.0008 | 0.4863 | 1.0005 |
| EV | -1.1441 | 0.4237 | 0.0069 | 0.3185 |
| M | 0.4694 | 0.2260 | 0.0378 | 1.5990 |
| R | -0.4939 | 0.1228 | 0.0001 | 0.6102 |
| I | -0.7537 | 0.6646 | 0.2568 | 0.4706 |
| E | 1.4179 | 0.7166 | 0.0478 | 4.1286 |
| G | 0.1826 | 0.3047 | 0.5491 | 1.2003 |

The results of the logit model demonstrated a statistically significant relationship between the parameters of governmental influence and the probability of choosing the strategy of full tax compliance. An increase in the probability of a tax audit positively affected the likelihood of full tax payment, whereas an increase in the expected value of gains from evasion, by contrast, reduced the level of tax discipline.

The moral-ethical framing of the experiment also demonstrated a positive effect on tax discipline; however, the strength of this effect proved to be heterogeneous depending on participants' individual propensity for risk. Participants with high levels of risk tolerance responded less strongly to moral incentives compared with participants characterized by moderate or low risk propensity.

The obtained results confirm that tax behavior is shaped simultaneously by rational-economic and behavioral-moral factors. At the same time, the statistically significant variables were primarily those associated with expected economic benefits and the risk of punishment, indicating a high sensitivity of participants' behavioral responses to changes in the economic parameters of the experimental environment.

Additional estimation of the model using clustered standard errors at the participant level confirmed the overall robustness of the main results. The most statistically significant factors remained the probability of a tax audit, the expected value of gains from tax evasion, and the level of risk propensity. At the same time, the statistical significance of certain behavioral variables decreased somewhat after accounting for the repeated nature of the observations, indicating the presence of intra-individual dependence in decision-making.

To summarize the obtained results and improve the readability of the article, the principal empirical findings of the study are systematized in Table 10.

| Table 10. Summary of the main research findings. | |
|---|---|
| Research Question | Result |
| Does the probability of an audit affect taxpayer behavior regarding tax evasion? | Yes, positively and statistically significantly ($p < 0.001$) |
| Does the penalty affect taxpayer behavior regarding tax evasion? | The effect is not statistically significant |
| Does moral framing affect taxpayer behavior regarding tax evasion? | Weak positive effect ($p \approx 0.06$) |
| Was a learning effect detected? | No convincing evidence was obtained |
| Does taxpayer behavior regarding tax evasion conform to the Allingham–Sandmo model? | Partially |

Overall, the obtained results indicate the dominant role of the probability of a tax audit, the limited impact of penalty sanctions, and the presence of a moderate effect of prosocial framing.

DISCUSSION

One of the key issues in ensuring tax discipline concerns the behavioral aspects of taxpayer decision-making, which integrate rational economic motives with moral and ethical considerations. As demonstrated by the experimental results, participants' behavior did not fully align with the assumptions of the Allingham–Sandmo model (Allingham & Sandmo, 1972), which is based on the rational maximization of expected utility.

The data confirm that the probability of audit and the magnitude of penalties significantly affect tax compliance, though in a nonlinear manner. When audit probability was low (below 10%), most participants tended to evade, whereas increasing the audit risk above 40–50% led to a sharp rise in voluntary compliance. Similar findings were reported by C. Clotfelter (1983) (Clotfelter, 1983) and J. Alm, G. McClelland, and W. Schulze (1992) (Alm, McClelland & Schulze, 1992), who observed that taxpayer responses to punishment threats exhibit threshold effects rather than proportional reactions to sanction increases.

Econometric modeling further confirmed the statistical significance of these patterns. The results of the logit model demonstrated that the most influential predictors of choosing a strategy of full tax compliance were the probability of audit and the expected mathematical gain from tax evasion. At the same time, the moral-ethical framing also exerted a positive effect on tax compliance, although its impact was less stable and depended on participants' individual characteristics, particularly their risk propensity.

Particular attention should also be paid to the ethical dimension of the experiment. In the second game, where participants knew that paid taxes would be allocated to charitable purposes, several participant subgroups demonstrated an increase of 15–20% in the frequency of decisions involving full tax payment. However, this effect concerned specifically the frequency of full compliance rather than necessarily reducing the overall amount of unpaid taxes. This aligns with the conclusions of B. Frey & B. Torgler (2007) (Frey & Torgler, 2007), who emphasized the role of moral motivation and institutional trust in fostering tax compliance. These results also correspond with L. Feld and B. Frey (2002) (Feld & Frey, 2002), who demonstrated that the "psychological contract" between the state and taxpayers can effectively substitute for strict control and punishment mechanisms.

Thus, the obtained results make it possible to conclude that the combination of economic and behavioral incentives is associated with changes in participants' behavioral responses regarding tax payment decisions. In particular, prosocial framing of the use of tax revenues was associated with an increase in the proportion of decisions involving full tax payment in several participant groups; however, this effect was not homogeneous with respect to the actual scale of tax evasion and the economic benefits derived from it.

At the same time, the study has several limitations.

First, one of the key methodological limitations of the study is the sequential implementation of two games with the same group of participants without counterbalancing the order of conditions. Such a design does not allow for a complete separation of the influence of the moral-ethical factor from possible learning effects, adaptation to the game conditions, behavioral fatigue, changes in risk attitudes, or the accumulation of previous successful or unsuccessful experiences with tax evasion. Therefore, the observed behavioral differences between the first and second games should not be interpreted as a direct causal effect of moral motivation, but rather as the result of a complex interaction of moral, psychological, and adaptive factors.

The obtained results indicate that participants' behavior is adaptive in nature and is shaped not only by the current parameters of monitoring and sanctions but also by accumulated experience. Evidence of behavioral inertia was identified: both after successful tax evasion and after the imposition of sanctions, participants frequently repeated their previous strategy. This finding is consistent with the concepts of reinforcement learning and experience-based decision making, according to which economic agents adjust their subjective assessments of risk on the basis of personal experience. Therefore, part of the differences observed between the first and second games may be explained not only by moral framing but also by learning and adaptation effects.

The identified patterns may be consistent with a number of behavioral mechanisms, including learning, adaptation to repeated decision-making, and changes in risk perception. At the same time, the examination of these mechanisms falls beyond the scope of the present study.

At the same time, the use of the same participant pool in both games made it possible to minimize the influence of intergroup heterogeneity and individual psychological differences among respondents. This provided an opportunity to analyze behavioral changes within a single sample and increased the internal consistency of the obtained results.

Second, the experimental sample was limited to students aged 17–20, which does not allow the findings to be fully generalized to the broader population of taxpayers. In addition, the relatively small sample size limits the statistical power of the study and increases the probability of random behavioral deviations. Therefore, the obtained results should not be considered a representative characterization of taxpayers' behavior in general, but rather an experimental model of young economic agents' responses to changes in the parameters of the tax environment.

Third, the game reproduced a simplified model of taxation that did not include complex elements of a real tax system, such as tax benefits, deductions, and different types of taxes.

Fourth, the moral-ethical component of the second game reflected charitable or prosocial framing rather than a full-fledged simulation of the social function of taxation. Participants associated paid taxes with a charitable purpose, which is closer to voluntary prosocial behavior than to an actual system of tax relations. Unlike charitable contributions, taxes are compulsory in nature and are connected with institutional trust, state legitimacy, perceptions of tax fairness, and the quality of public services. Consequently, the obtained results should not be interpreted as direct empirical evidence of the influence of the social function of taxation on tax compliance, but rather as an assessment of participants' responses to the prosocial framing of financial decisions.

Fifth, the short-term nature of the experiment does not account for the effects of accumulated trust or tax fatigue, which may emerge over the long term.

Sixth, the analysis of certain socio-behavioral characteristics was conducted on the basis of relatively small participant subgroups, which limits the statistical reliability of intergroup comparisons. This particularly concerns specific categories of risk propensity and groups possessing distinct behavioral experience. Therefore, the identified differences should be interpreted as preliminary behavioral indicators requiring further verification using larger and more representative samples.

Seventh, the experimental audit and penalty parameters should be regarded as abstract proxies for real-world tax enforcement mechanisms. Therefore, the results of the study primarily characterize behavioral patterns of decision-making under different regimes of risk and sanctions rather than the direct effectiveness of specific public tax policy instruments.

Despite these limitations, the experiment provides indicative insights for designing tax policies that rely not only on enforcement but also on encouraging compliant behavior through transparency, targeted use of tax funds, and enhanced trust in public institutions.

Thus, the conducted study confirms that effective tax discipline is shaped not merely by the fear of sanctions, but primarily through the integration of economic rationality, social responsibility, and the moral legitimacy of taxation.

The study did not confirm statistically significant heterogeneity in the effect of prosocial framing with respect to gender or other individual participant characteristics. Therefore, the obtained results do not allow conclusions to be drawn as to whether certain groups of taxpayers are more sensitive to moral and ethical incentives. To test such hypotheses, future research should employ larger samples and explicitly specified interaction models.

The conducted experiment should be viewed as a pilot behavioral study, the results of which may serve as a foundation for future large-scale experimental and field research on tax behavior. The obtained findings characterize participants' behavioral responses to experimental stimuli and should not be interpreted as direct estimates of the effectiveness of actual tax administration instruments.

CONCLUSIONS

The conducted study made it possible to obtain a number of empirical findings, summarized in Table 12, that characterize the influence of economic and behavioral factors on the tax behavior of participants in a laboratory experiment.

The scientific novelty of the study lies in the combination of a laboratory tax game, prosocial framing, and binary-choice econometric analysis to assess the interaction between economic and moral determinants of tax behavior. The obtained results indicate that the probability of an audit remains the key determinant of tax compliance, whereas moral framing primarily affects the frequency of violations rather than the intensity of tax evasion.

The application of an integrated approach – combining theoretical modeling, a laboratory experiment, and binary-choice econometric modeling – made it possible to conduct a comprehensive analysis of the interaction between institutional and psychological determinants of tax behavior.

The results of the experiment conducted on a youth sample indicate that, under conditions of laboratory simulation, participants' behavior partially corresponded to the predictions of classical rationalist models of taxation, as the level of tax evasion increased in rounds characterized by a positive expected mathematical gain from nonpayment of taxes. At the same time, a substantial proportion of tax evasion cases under conditions of a negative expected payoff suggests the significant role of behavioral biases, subjective risk perception, and bounded rationality in tax-related decision-making processes. This confirms that the economic parameters of the experimental environment represented important factors associated with changes in participants' tax behavior.

The conducted logit modeling made it possible to statistically confirm the influence of key economic and behavioral factors on the probability of choosing a strategy of full tax compliance. The most significant determinants were the level of tax enforcement and the expected benefit from tax evasion. At the same time, the introduction of a moral-ethical framing was associated with changes in the structure of participants' behavioral responses regarding tax payment decisions.

At the same time, the experimental findings demonstrated the presence of behavioral changes associated with the introduction of the moral-ethical component of the game. However, due to the sequential nature of the experiment without counterbalancing the order of conditions, the observed effects cannot be interpreted exclusively as a causal consequence of moral motivation, since they may have been partially shaped by participants' adaptation to the experimental environment.

Additional analysis of sequential decisions showed that tax behavior exhibits a pronounced dynamic character. Previous experiences of successful tax evasion, detection of noncompliance, or financial losses affect participants' subsequent decisions, although this influence proved to be weaker than might be expected from the perspective of classical deterrence theory. This finding indicates the need to account for learning and adaptation effects when interpreting the results of laboratory experiments on tax compliance.

The obtained results are consistent with contemporary behavioral approaches to the analysis of tax compliance, particularly the concepts of tax morale and the slippery slope framework, according to which tax behavior is shaped not only by coercive instruments of state control, but also by moral motivation, institutional trust, and perceptions of social fairness. At the same time, the experimental findings confirm that the effectiveness of moral and ethical incentives is heterogeneous and context-dependent in nature.

The obtained results indicate that, under the conditions of the conducted laboratory experiment, participants' behavioral responses were associated both with the economic parameters of the environment and with the moral-ethical context of decision-making. This makes it possible to regard behavioral factors as a promising avenue for future tax compliance research. The findings allow for the formulation of a preliminary hypothesis regarding a possible relationship between the moral-ethical context of decision-making and the level of voluntary tax compliance under laboratory conditions. Moreover, the experimental results indicate a reduction in the number of instances of partial tax payment under conditions of prosocial framing. At the same time, no comparable reduction was observed in the aggregate magnitude of tax evasion or in the expected benefit derived from it. This suggests that the moral-ethical context may primarily affect the frequency of tax evasion, whereas its impact on the magnitude of evasion is less clear and requires further investigation.

The identified differences among individual behavioral and social subgroups of participants are preliminary in nature and require further empirical verification using broader samples. Given the limited size of the experimental sample, the obtained findings should primarily be interpreted as indicative behavioral tendencies.

At the same time, the results of the study should be interpreted in light of its limitations. The experiment was conducted on a small student sample and simulated tax decisions in a laboratory environment that does not fully reproduce the institutional features of a real-world tax system. Therefore, the findings should be regarded as preliminary results of a pilot study that identify potential behavioral patterns of tax compliance and require further validation using larger and more representative samples.

The theoretical contribution of the study lies in advancing the behavioral approach to the analysis of tax compliance by providing empirical evidence that taxpayer behavior is determined not only by the balance of expected gains and losses but also by the moral-ethical context of decision-making and prior behavioral experience. The obtained findings extend the Allingham-Sandmo model by incorporating the contextual and adaptive nature of tax behavior.

The methodological contribution of the study lies in the integration of a laboratory tax experiment, expected-value analysis of tax decisions, and logit modeling of behavioral choice within a single analytical framework. The proposed distinction between the EV1UAN, EVdecision, and aggregated EV indicators makes it possible to separate the characteristics of the incentive environment from the characteristics of participants' actual behavior.

The empirical contribution of the study lies in providing experimental evidence that the probability of a tax audit is the most influential factor affecting voluntary tax compliance, whereas prosocial framing is primarily associated with changes in the frequency of choosing full tax compliance strategies. In addition, evidence of behavioral inertia was identified, whereby prior experiences of tax evasion or compliance with tax obligations influence participants' subsequent decisions.

The obtained results confirm that tax behavior is shaped not only by the economic incentives predicted by classical rational-choice models but also by socio-psychological factors. The effects identified in the experiment are consistent with the concepts of tax morale, legitimacy theory, and behavioral nudging, which view voluntary tax compliance as the outcome of the interaction among economic, moral, and institutional factors.

Future research should aim to broaden the empirical base by including taxpayers from diverse age, professional, and social groups, and to employ more sophisticated experimental simulations that take into account informational asymmetry, social interactions, and group effects. A promising direction involves combining laboratory and field experiments, which would allow for testing the consistency of behavioral models with real-world tax practices.

Future studies should also employ experimental designs incorporating counterbalancing of condition order or random assignment of participants to different game sequences. This would allow for a more accurate separation of the effects of moral-ethical incentives from the effects of learning, adaptation, behavioral fatigue, and changes in risk attitudes during repeated participation in the experiment.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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МОДЕЛЮВАННЯ ПОВЕДІНКИ ПЛАТНИКІВ ПОДАТКІВ: ЕКСПЕРИМЕНТАЛЬНИЙ АНАЛІЗ РЕАКЦІЙ НА ПАРАМЕТРИ ПОДАТКОВОЇ ГРИ

У статті представлено результати експериментального дослідження впливу ймовірності перевірок, рівня штрафів і морально-етичної мотивації на поведінку платників податків щодо сплати податкових зобов'язань. Метою дослідження є аналіз поведінкових реакцій учасників лабораторного експерименту на зміну параметрів податкової гри, які моделюють різні режими контролю, санкцій і просоціального фреймування.

Методологія дослідження базується на принципах експериментальної економіки та економетричного моделювання. Учасники ухвалювали рішення про сплату податків або ухилення від сплати податків за різних комбінацій рівня контролю та розміру санкцій, а аналіз зв'язку між економічними та поведінковими чинниками й вибором стратегій податкової поведінки здійснювався із застосуванням логіт-моделі бінарного вибору. Особливістю дослідження є проведення двох послідовних ігор: контрольної, де зібрані кошти не мали соціального значення, та морально орієнтованої, у якій сплата податків у межах експерименту асоціювалася з просоціальною метою використання коштів, що створювало ефект благодійного фреймінгу. Такий підхід дозволив оцінити можливий вплив морально-етичних стимулів на фінансову поведінку учасників, хоча отримані результати можуть частково відображати також ефекти навчання та адаптації.

Отримані результати свідчать про переважно адаптивний і контекстуально залежний характер рішень учасників: рівень ухилення від податків зростає за низької ймовірності перевірки та помірних штрафів і знижується за умов суворого контролю. Виявлено також поведінкові відмінності між контрольною грою та грою з просоціальним фреймуванням. Отримані результати свідчать, що морально-етичне фреймування може по-різному впливати на різні аспекти податкової поведінки. Вплив морального фреймування виявився більш помітним на рівні частоти поведінкових виборів, ніж на рівні інтенсивності ухилення від оподаткування.

Основний теоретичний висновок полягає в тому, що податкова поведінка формується під впливом взаємодії економічних стимулів, морально-етичних чинників та адаптивних поведінкових механізмів. Отримані результати свідчать про потенційну роль поведінкових чинників в ухваленні податкових рішень в умовах лабораторного експерименту, проте обмежений обсяг вибірки не дозволяє безпосередньо екстраполювати їх на ширшу сукупність платників податків.

Ключові слова: податкова політика, податковий комплаєнс, податкова культура, ухиляння від оподаткування, морально-етичне фреймування, податковий аудит, штрафні санкції, поведінкова економіка, експериментальна економіка, добровільна сплата податків

JEL Класифікація: H26, C91, D90, H20

Appendix A. Results of the participants' survey.

| Player number | Age | Gender | Investment Experience | Risk Tolerance (10-point scale) | Experience of Tax Evasion |
|---------------|-----|--------|-----------------------|---------------------------------|---------------------------|
| 1 | 17 | female | absent | 7 | absent |
| 2 | 19 | male | present | 5 | present |
| 3 | 18 | female | absent | 5 | absent |
| 4 | 18 | female | absent | 4 | absent |
| 5 | 19 | female | absent | 5 | absent |
| 6 | 19 | female | present | 7 | present |
| 7 | 18 | female | absent | 8 | present |
| 8 | 19 | female | absent | 8 | absent |
| 9 | 19 | female | absent | 9 | absent |
| 10 | 20 | female | absent | 8 | present |
| 11 | 18 | female | absent | 7 | present |
| 12 | 20 | female | absent | 6 | absent |
| 13 | 19 | male | absent | 5 | absent |
| 14 | 18 | female | absent | 7 | absent |
| 15 | 18 | male | absent | 6 | absent |
| 16 | 18 | female | absent | 5 | absent |
| 17 | 20 | female | absent | 5 | absent |
| 18 | 19 | male | present | 7 | present |
| 19 | 19 | male | present | 7 | absent |
| 20 | 19 | female | absent | 7 | absent |

Appendix B. Actual tax payments made by participants. Notes: Players highlighted in gray indicate those who, in the respective game rounds, were randomly selected for tax audit.

| Player number | Amount of Tax Actually Paid out of UAH 10 Liability (UAH) | | | | | | | | | |
|-------------------|---|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Round 6 | Round 7 | Round 8 | Round 9 | Round 10 |
| <i>First Game</i> | | | | | | | | | | |
| 1 | 8 | 6 | 9 | 9 | 7 | 10 | 5 | 7 | 10 | 0 |
| 2 | 10 | 10 | 0 | 10 | 10 | 5 | 0 | 10 | 5 | 10 |
| 3 | 10 | 5 | 10 | 10 | 5 | 10 | 10 | 10 | 10 | 0 |
| 4 | 10 | 3 | 10 | 10 | 2 | 10 | 10 | 8 | 10 | 0 |
| 5 | 10 | 7 | 5 | 10 | 10 | 7 | 5 | 10 | 7 | 0 |
| 6 | 9 | 7 | 2 | 7 | 5 | 8 | 10 | 8 | 10 | 0 |
| 7 | 10 | 0 | 10 | 10 | 10 | 0 | 10 | 0 | 10 | 10 |
| 8 | 10 | 8 | 6 | 10 | 7 | 6 | 9 | 8 | 10 | 0 |
| 9 | 10 | 7 | 5 | 10 | 7 | 7 | 7 | 7 | 10 | 0 |
| 10 | 9 | 0 | 2 | 7 | 10 | 10 | 0 | 9 | 0 | 0 |
| 11 | 10 | 10 | 10 | 10 | 10 | 0 | 10 | 10 | 10 | 5 |
| 12 | 10 | 8 | 7 | 8 | 10 | 6 | 5 | 10 | 9 | 7 |
| 13 | 8 | 9 | 5 | 9 | 9 | 8 | 10 | 6 | 10 | 0 |
| 14 | 10 | 7 | 5 | 10 | 4 | 2 | 7 | 5 | 10 | 3 |
| 15 | 10 | 0 | 0 | 10 | 7 | 5 | 10 | 10 | 8 | 0 |
| 16 | 10 | 10 | 8 | 0 | 0 | 10 | 0 | 9 | 9 | 8 |
| 17 | 10 | 5 | 7 | 8 | 7 | 8 | 9 | 10 | 10 | 5 |
| 18 | 10 | 0 | 3 | 10 | 0 | 7 | 0 | 10 | 10 | 0 |
| 19 | 7 | 3 | 5 | 9 | 3 | 2 | 5 | 6 | 6 | 2 |
| 20 | 5 | 0 | 5 | 8 | 9 | 7 | 5 | 8 | 9 | 2 |

| Player number | Amount of Tax Actually Paid out of UAH 10 Liability (UAH) | | | | | | | | | |
|--------------------|---|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Round 6 | Round 7 | Round 8 | Round 9 | Round 10 |
| <i>Second Game</i> | | | | | | | | | | |
| 1 | 8 | 6 | 4 | 8 | 7 | 9 | 5 | 10 | 7 | 0 |
| 2 | 10 | 0 | 0 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3 | 10 | 10 | 5 | 10 | 10 | 10 | 10 | 10 | 10 | 0 |
| 4 | 10 | 4 | 2 | 10 | 10 | 4 | 10 | 10 | 10 | 0 |
| 5 | 10 | 0 | 0 | 10 | 10 | 0 | 10 | 10 | 10 | 0 |
| 6 | 10 | 6 | 0 | 10 | 10 | 6 | 8 | 10 | 6 | 0 |
| 7 | 10 | 0 | 0 | 10 | 10 | 10 | 0 | 10 | 10 | 0 |
| 8 | 8 | 8 | 3 | 10 | 5 | 6 | 7 | 8 | 10 | 0 |
| 9 | 8 | 3 | 3 | 9 | 5 | 6 | 7 | 7 | 8 | 0 |
| 10 | 7 | 0 | 0 | 10 | 5 | 5 | 0 | 10 | 5 | 10 |
| 11 | 10 | 0 | 0 | 10 | 10 | 10 | 10 | 10 | 10 | 0 |
| 12 | 9 | 10 | 3 | 7 | 10 | 10 | 6 | 10 | 7 | 10 |
| 13 | 10 | 8 | 10 | 10 | 5 | 9 | 10 | 10 | 10 | 0 |
| 14 | 6 | 3 | 4 | 10 | 2 | 5 | 10 | 7 | 10 | 10 |
| 15 | 10 | 10 | 0 | 8 | 2 | 10 | 0 | 2 | 10 | 0 |
| 16 | 8 | 10 | 8 | 10 | 7 | 6 | 10 | 8 | 10 | 10 |
| 17 | 10 | 9 | 7 | 10 | 6 | 10 | 10 | 5 | 10 | 6 |
| 18 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 10 | 10 | 0 |
| 19 | 10 | 0 | 0 | 10 | 0 | 0 | 10 | 10 | 10 | 0 |
| 20 | 7 | 2 | 0 | 7 | 6 | 8 | 5 | 8 | 9 | 2 |

Appendix C. Actual financial effects of tax evasion by participants.

| Player number | Actual Financial Effect (UAH) | | | | | | | | | |
|--------------------|-------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Round 6 | Round 7 | Round 8 | Round 9 | Round 10 |
| <i>First Game</i> | | | | | | | | | | |
| 1 | 2.00 | 4.00 | 1.00 | -0.80 | 3.00 | 0.00 | 5.00 | 3.00 | 0.00 | 10.00 |
| 2 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | -25.00 | -5.00 | 0.00 | -1.25 | 0.00 |
| 3 | 0.00 | 5.00 | 0.00 | 0.00 | -11.70 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 |
| 4 | 0.00 | 7.00 | 0.00 | 0.00 | 8.00 | 0.00 | 0.00 | 2.00 | 0.00 | 10.00 |
| 5 | 0.00 | 3.00 | -1.25 | 0.00 | 0.00 | 3.00 | -2.50 | 0.00 | -0.75 | 10.00 |
| 6 | -0.67 | -15.00 | 8.00 | -2.40 | 5.00 | 2.00 | 0.00 | -5.00 | 0.00 | 10.00 |
| 7 | 0.00 | 10.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 10.00 | 0.00 | 0.00 |
| 8 | 0.00 | 2.00 | -1.00 | 0.00 | 3.00 | -20.00 | 1.00 | 2.00 | 0.00 | 10.00 |
| 9 | 0.00 | 3.00 | 5.00 | 0.00 | -7.02 | 3.00 | 3.00 | -7.50 | 0.00 | 10.00 |
| 10 | -0.67 | 10.00 | 8.00 | 3.00 | 0.00 | 0.00 | 10.00 | 1.00 | 10.00 | 10.00 |
| 11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | 0.00 | 5.00 |
| 12 | 0.00 | 2.00 | -0.75 | -1.60 | 0.00 | 4.00 | -2.50 | 0.00 | 1.00 | 3.00 |
| 13 | 2.00 | -5.00 | -1.25 | 1.00 | -2.34 | 2.00 | 0.00 | 4.00 | 0.00 | 10.00 |
| 14 | 0.00 | 3.00 | 5.00 | 0.00 | 6.00 | 8.00 | -1.50 | 5.00 | 0.00 | 7.00 |
| 15 | 0.00 | 10.00 | 10.00 | 0.00 | 3.00 | 5.00 | 0.00 | 0.00 | -0.50 | 10.00 |
| 16 | 0.00 | 0.00 | 0.50 | -8.00 | 10.00 | 0.00 | 10.00 | -2.50 | -0.25 | 2.00 |
| 17 | 0.00 | 5.00 | 3.00 | -1.60 | 3.00 | -10.00 | 1.00 | 0.00 | 0.00 | 5.00 |
| 18 | 0.00 | 10.00 | 7.00 | 0.00 | 10.00 | 3.00 | -5.00 | 0.00 | 0.00 | 10.00 |
| 19 | 3.00 | 7.00 | 5.00 | -0.80 | 7.00 | 8.00 | 5.00 | 4.00 | -1.00 | 8.00 |
| 20 | -3.35 | 10.00 | 5.00 | 2.00 | -2.34 | 3.00 | 5.00 | -5.00 | 1.00 | 8.00 |
| <i>Second Game</i> | | | | | | | | | | |

| Player number | Actual Financial Effect (UAH) | | | | | | | | | |
|---------------|-------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Round 6 | Round 7 | Round 8 | Round 9 | Round 10 |
| 1 | 2.00 | 4.00 | 6.00 | 2.00 | 3.00 | 1.00 | -2.50 | 0.00 | -0.75 | 10.00 |
| 2 | 0.00 | 10.00 | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 0.00 | 0.00 | 5.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 |
| 4 | 0.00 | 6.00 | -2.00 | 0.00 | 0.00 | 6.00 | 0.00 | 0.00 | 0.00 | 10.00 |
| 5 | 0.00 | 10.00 | -2.50 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | 0.00 | 10.00 |
| 6 | 0.00 | -20.00 | 10.00 | 0.00 | 0.00 | 4.00 | 2.00 | 0.00 | 4.00 | 10.00 |
| 7 | 0.00 | 10.00 | 10.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | 10.00 |
| 8 | -1.34 | 2.00 | -1.75 | 0.00 | 5.00 | -20.00 | -1.50 | -5.00 | 0.00 | 10.00 |
| 9 | -1.34 | 7.00 | 7.00 | 1.00 | -11.70 | 4.00 | 3.00 | 3.00 | -0.50 | 10.00 |
| 10 | -2.01 | 10.00 | 10.00 | 0.00 | -11.70 | 5.00 | 10.00 | 0.00 | -1.25 | 0.00 |
| 11 | 0.00 | 10.00 | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 |
| 12 | -0.67 | 0.00 | 7.00 | -2.40 | 0.00 | 0.00 | -2.00 | 0.00 | -0.75 | 0.00 |
| 13 | 0.00 | 2.00 | 0.00 | 0.00 | 5.00 | -5.00 | 0.00 | 0.00 | 0.00 | 10.00 |
| 14 | -2.68 | 7.00 | 6.00 | 0.00 | 8.00 | 5.00 | 0.00 | 3.00 | 0.00 | 0.00 |
| 15 | 0.00 | 0.00 | 10.00 | -1.60 | 8.00 | 0.00 | 10.00 | 8.00 | 0.00 | 10.00 |
| 16 | 2.00 | 0.00 | 2.00 | 0.00 | 3.00 | 4.00 | 0.00 | 2.00 | 0.00 | 0.00 |
| 17 | 0.00 | 1.00 | -0.75 | 0.00 | 4.00 | 0.00 | 0.00 | 5.00 | 0.00 | 4.00 |
| 18 | 0.00 | 10.00 | 10.00 | 0.00 | -23.40 | -50.00 | -5.00 | 0.00 | 0.00 | -100.00 |
| 19 | 0.00 | 10.00 | 10.00 | 0.00 | 10.00 | 10.00 | 0.00 | 0.00 | 0.00 | 10.00 |
| 20 | -2.01 | 8.00 | -2.50 | 3.00 | 4.00 | 2.00 | -2.50 | 2.00 | 1.00 | 8.00 |

Appendix D. Expected value of tax evasion by game round. Notes: x – amount of unpaid tax liability (UAH), a – probability of audit (%), b – penalty rate (%).

| Game Round Number | Initial Conditions | | Formula for Calculating the Expected Value of Tax Evasion | Expected Value per Each Unpaid Hryvnia of Tax Liability (UAH) |
|-------------------|--------------------|------|---|---|
| | b, % | a, % | | |
| 1 | 67 | 60 | $EV_y = x(1 - 60/100) - x(60/100)(67/100)$ | -0.0020 |
| 2 | 500 | 10 | $EV_y = x(1 - 10/100) - x(10/100)(500/100)$ | 0.4000 |
| 3 | 25 | 25 | $EV_y = x(1 - 25/100) - x(25/100)(25/100)$ | 0.6875 |
| 4 | 80 | 70 | $EV_y = x(1 - 70/100) - x(70/100)(80/100)$ | -0.2600 |
| 5 | 234 | 30 | $EV_y = x(1 - 30/100) - x(30/100)(234/100)$ | -0.0020 |
| 6 | 500 | 20 | $EV_y = x(1 - 20/100) - x(20/100)(500/100)$ | -0.2000 |
| 7 | 50 | 50 | $EV_y = x(1 - 50/100) - x(50/100)(50/100)$ | 0.2500 |
| 8 | 250 | 40 | $EV_y = x(1 - 40/100) - x(40/100)(250/100)$ | -0.4000 |
| 9 | 25 | 80 | $EV_y = x(1 - 80/100) - x(80/100)(25/100)$ | 0.0000 |
| 10 | 1000 | 5 | $EV_y = x(1 - 5/100) - x(5/100)(1000/100)$ | 0.4500 |

Appendix E. Expected value of actual tax evasion by experiment participants.

| Player number | Expected Value of Tax Evasion (UAH) | | | | | | | | | | |
|---------------|-------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|----------|-------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Round 6 | Round 7 | Round 8 | Round 9 | Round 10 | Total |
| First Game | | | | | | | | | | | |
| 1 | -0.004 | 1.600 | 0.688 | -0.260 | -0.006 | 0.000 | 1.250 | -1.200 | 0.000 | 4.500 | 6.568 |
| 2 | 0.000 | 0.000 | 6.875 | 0.000 | 0.000 | -1.000 | 2.500 | 0.000 | 0.000 | 0.000 | 8.375 |
| 3 | 0.000 | 2.000 | 0.000 | 0.000 | -0.010 | 0.000 | 0.000 | 0.000 | 0.000 | 4.500 | 6.490 |
| 4 | 0.000 | 2.800 | 0.000 | 0.000 | -0.016 | 0.000 | 0.000 | -0.800 | 0.000 | 4.500 | 6.484 |

| Player number | Expected Value of Tax Evasion (UAH) | | | | | | | | | | Total |
|---------------|-------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|----------|--------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Round 6 | Round 7 | Round 8 | Round 9 | Round 10 | |
| 5 | 0.000 | 1.200 | 3.438 | 0.000 | 0.000 | -0.600 | 1.250 | 0.000 | 0.000 | 4.500 | 9.788 |
| 6 | -0.002 | 1.200 | 5.500 | -0.780 | -0.010 | -0.400 | 0.000 | -0.800 | 0.000 | 4.500 | 9.208 |
| 7 | 0.000 | 4.000 | 0.000 | 0.000 | 0.000 | -2.000 | 0.000 | -4.000 | 0.000 | 0.000 | -2.000 |
| 8 | 0.000 | 0.800 | 2.750 | 0.000 | -0.006 | -0.800 | 0.250 | -0.800 | 0.000 | 4.500 | 6.694 |
| 9 | 0.000 | 1.200 | 3.438 | 0.000 | -0.006 | -0.600 | 0.750 | -1.200 | 0.000 | 4.500 | 8.082 |
| 10 | -0.002 | 4.000 | 5.500 | -0.780 | 0.000 | 0.000 | 2.500 | -0.400 | 0.000 | 4.500 | 15.318 |
| 11 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | -2.000 | 0.000 | 0.000 | 0.000 | 2.250 | 0.250 |
| 12 | 0.000 | 0.800 | 2.063 | -0.520 | 0.000 | -0.800 | 1.250 | 0.000 | 0.000 | 1.350 | 4.143 |
| 13 | -0.004 | 0.400 | 3.438 | -0.260 | -0.002 | -0.400 | 0.000 | -1.600 | 0.000 | 4.500 | 6.072 |
| 14 | 0.000 | 1.200 | 3.438 | 0.000 | -0.012 | -1.600 | 0.750 | -2.000 | 0.000 | 3.150 | 4.926 |
| 15 | 0.000 | 4.000 | 6.875 | 0.000 | -0.006 | -1.000 | 0.000 | 0.000 | 0.000 | 4.500 | 14.369 |
| 16 | 0.000 | 0.000 | 1.375 | -2.600 | -0.020 | 0.000 | 2.500 | -0.400 | 0.000 | 0.900 | 1.755 |
| 17 | 0.000 | 2.000 | 2.063 | -0.520 | -0.006 | -0.400 | 0.250 | 0.000 | 0.000 | 2.250 | 5.637 |
| 18 | 0.000 | 4.000 | 4.813 | 0.000 | -0.020 | -0.600 | 2.500 | 0.000 | 0.000 | 4.500 | 15.193 |
| 19 | -0.006 | 2.800 | 3.438 | -0.260 | -0.014 | -1.600 | 1.250 | -1.600 | 0.000 | 3.600 | 7.608 |
| 20 | -0.010 | 4.000 | 3.438 | -0.520 | -0.002 | -0.600 | 1.250 | -0.800 | 0.000 | 3.600 | 10.356 |
| Second Game | | | | | | | | | | | |
| 1 | -0.004 | 1.600 | 4.125 | -0.520 | -0.006 | -0.200 | 1.250 | 0.000 | 0.000 | 4.500 | 10.745 |
| 2 | 0.000 | 4.000 | 6.875 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 10.875 |
| 3 | 0.000 | 0.000 | 3.438 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 4.500 | 7.938 |
| 4 | 0.000 | 2.400 | 5.500 | 0.000 | 0.000 | -1.200 | 0.000 | 0.000 | 0.000 | 4.500 | 11.200 |
| 5 | 0.000 | 4.000 | 6.875 | 0.000 | 0.000 | -2.000 | 0.000 | 0.000 | 0.000 | 4.500 | 13.375 |
| 6 | 0.000 | 1.600 | 6.875 | 0.000 | 0.000 | -0.800 | 0.500 | 0.000 | 0.000 | 4.500 | 12.675 |
| 7 | 0.000 | 4.000 | 6.875 | 0.000 | 0.000 | 0.000 | 2.500 | 0.000 | 0.000 | 4.500 | 17.875 |
| 8 | -0.004 | 0.800 | 4.813 | 0.000 | -0.010 | -0.800 | 0.750 | -0.800 | 0.000 | 4.500 | 9.249 |
| 9 | -0.004 | 2.800 | 4.813 | -0.260 | -0.010 | -0.800 | 0.750 | -1.200 | 0.000 | 4.500 | 10.589 |
| 10 | -0.006 | 4.000 | 6.875 | 0.000 | -0.010 | -1.000 | 2.500 | 0.000 | 0.000 | 0.000 | 12.359 |
| 11 | 0.000 | 4.000 | 6.875 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 4.500 | 15.375 |
| 12 | -0.002 | 0.000 | 4.813 | -0.780 | 0.000 | 0.000 | 1.000 | 0.000 | 0.000 | 0.000 | 5.031 |
| 13 | 0.000 | 0.800 | 0.000 | 0.000 | -0.010 | -0.200 | 0.000 | 0.000 | 0.000 | 4.500 | 5.090 |
| 14 | -0.008 | 2.800 | 4.125 | 0.000 | -0.016 | -1.000 | 0.000 | -1.200 | 0.000 | 0.000 | 4.701 |
| 15 | 0.000 | 0.000 | 6.875 | -0.520 | -0.016 | 0.000 | 2.500 | -3.200 | 0.000 | 4.500 | 10.139 |
| 16 | -0.004 | 0.000 | 1.375 | 0.000 | -0.006 | -0.800 | 0.000 | -0.800 | 0.000 | 0.000 | -0.235 |
| 17 | 0.000 | 0.400 | 2.063 | 0.000 | -0.008 | 0.000 | 0.000 | -2.000 | 0.000 | 1.800 | 2.255 |
| 18 | 0.000 | 4.000 | 6.875 | 0.000 | -0.020 | -2.000 | 2.500 | 0.000 | 0.000 | 4.500 | 15.855 |
| 19 | 0.000 | 4.000 | 6.875 | 0.000 | -0.020 | -2.000 | 0.000 | 0.000 | 0.000 | 4.500 | 13.355 |
| 20 | -0.006 | 3.200 | 6.875 | -0.780 | -0.008 | -0.400 | 1.250 | -0.800 | 0.000 | 3.600 | 12.931 |

Appendix F. Characteristics of participants' tax payment decision outcomes (both games combined). Notes: RTC_m – rate of full tax compliance strategy chosen by male participants, RTC_x – rate of full tax compliance strategy chosen by female participants, RTC_{ie} – rate of full tax compliance strategy chosen by participants with investment experience, RTC_{nie} – rate of full tax compliance strategy chosen by participants without investment experience, RTC_{te} – rate of full tax compliance strategy chosen by participants with prior tax evasion experience, RTC_{nte} – rate of full tax compliance strategy chosen by participants without prior tax evasion experience, $RTC_{r,4}$ – rate of full tax compliance strategy chosen by participants with a risk tolerance of 4/10, $RTC_{r,5}$ – rate of full tax compliance strategy chosen by participants with a risk tolerance of 5/10, $RTC_{r,6}$ – rate of full tax compliance strategy chosen by participants with a risk tolerance of 6/10, $RTC_{r,7}$ – rate of full tax compliance strategy chosen by participants with a risk tolerance of 7/10, $RTC_{r,8}$ – rate of full tax compliance strategy chosen by participants with a risk tolerance of 8/10, $RTC_{r,9}$ – rate of full tax compliance strategy chosen by participants with a risk tolerance of 9/10.

| Indicator Name | Indicator Value (%) | | | | | | | | | | Average Across All Rounds |
|--------------------|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------------------------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Round 6 | Round 7 | Round 8 | Round 9 | Round 10 | |
| RTC _m | 80.0 | 20.0 | 10.0 | 70.0 | 20.0 | 20.0 | 50.0 | 70.0 | 70.0 | 20.0 | 43.0 |
| RTC _x | 60.0 | 16.5 | 13.5 | 63.0 | 40.0 | 33.0 | 40.0 | 43.5 | 63.5 | 17.0 | 39.0 |
| RTC _{ie} | 75.0 | 12.5 | 0.0 | 75.0 | 37.5 | 12.5 | 37.5 | 75.0 | 62.5 | 25.0 | 41.3 |
| RTC _{nle} | 62.5 | 19.0 | 15.5 | 62.5 | 34.5 | 34.5 | 47.0 | 43.5 | 59.5 | 15.5 | 39.4 |
| RTC _{te} | 75.0 | 16.5 | 16.5 | 83.5 | 67.0 | 33.5 | 41.5 | 75.0 | 67.0 | 33.0 | 50.9 |
| RTC _{nte} | 60.5 | 18.0 | 10.5 | 57.0 | 21.5 | 29.0 | 43.0 | 39.5 | 64.0 | 10.5 | 35.4 |
| RTC _{r4} | 100.0 | 0.0 | 50.0 | 100.0 | 50.0 | 50.0 | 100.0 | 50.0 | 100.0 | 0.0 | 60.0 |
| RTC _{r5} | 83.3 | 33.3 | 16.7 | 75.0 | 41.7 | 41.7 | 66.7 | 58.4 | 75.0 | 25.0 | 51.7 |
| RTC _{r6} | 75.0 | 50.0 | 0.0 | 25.0 | 50.0 | 50.0 | 25.0 | 75.0 | 25.0 | 25.0 | 40.0 |
| RTC _{r7} | 50.0 | 7.0 | 7.0 | 57.0 | 21.5 | 14.0 | 36.0 | 50.0 | 64.0 | 7.0 | 31.4 |
| RTC _{r8} | 50.0 | 0.0 | 16.7 | 83.4 | 50.0 | 33.3 | 16.7 | 33.4 | 66.7 | 33.3 | 38.3 |
| RTC _{r9} | 50.0 | 0.0 | 0.0 | 50.0 | 0.0 | 0.0 | 0.0 | 0.0 | 50.0 | 0.0 | 15.0 |

Appendix G. Characteristics of participants' tax payment decision outcomes by game. Notes: RTC_m – rate of full tax compliance strategy chosen by male participants, RTC_x – rate of full tax compliance strategy chosen by female participants, RTC_{ie} – rate of full tax compliance strategy chosen by participants with investment experience, RTC_{nle} – rate of full tax compliance strategy chosen by participants without investment experience, RTC_{te} – rate of full tax compliance strategy chosen by participants with prior tax evasion experience, RTC_{nte} – rate of full tax compliance strategy chosen by participants without prior tax evasion experience, RTC_{r4} – rate of full tax compliance strategy chosen by participants with a risk tolerance of 4/10, RTC_{r5} – rate of full tax compliance strategy chosen by participants with a risk tolerance of 5/10, RTC_{r6} – rate of full tax compliance strategy chosen by participants with a risk tolerance of 6/10, RTC_{r7} – rate of full tax compliance strategy chosen by participants with a risk tolerance of 7/10, RTC_{r8} – rate of full tax compliance strategy chosen by participants with a risk tolerance of 8/10, RTC_{r9} – rate of full tax compliance strategy chosen by participants with a risk tolerance of 9/10.

| Indicator Name | Indicator Value (%) | | | | | | | | | | Average Across All Rounds |
|--------------------|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------------------------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Round 6 | Round 7 | Round 8 | Round 9 | Round 10 | |
| First Game | | | | | | | | | | | |
| RTC _m | 60.0 | 20.0 | 0.0 | 60.0 | 20.0 | 0.0 | 40.0 | 60.0 | 40.0 | 20.0 | 32.0 |
| RTC _x | 73.0 | 13.0 | 27.0 | 53.0 | 33.0 | 33.0 | 33.0 | 27.0 | 67.0 | 7.0 | 36.6 |
| RTC _{ie} | 50.0 | 25.0 | 0.0 | 50.0 | 25.0 | 0.0 | 25.0 | 50.0 | 50.0 | 25.0 | 30.0 |
| RTC _{nle} | 75.0 | 13.0 | 25.0 | 56.0 | 31.0 | 31.0 | 38.0 | 31.0 | 63.0 | 6.0 | 36.9 |
| RTC _{te} | 67.0 | 33.0 | 33.0 | 67.0 | 67.0 | 17.0 | 50.0 | 50.0 | 67.0 | 33.0 | 48.4 |
| RTC _{nte} | 71.0 | 7.0 | 14.0 | 50.0 | 14.0 | 29.0 | 29.0 | 29.0 | 57.0 | 0.0 | 30.0 |
| RTC _{r4} | 100.0 | 0.0 | 100.0 | 100.0 | 0.0 | 100.0 | 100.0 | 0.0 | 100.0 | 0.0 | 60.0 |
| RTC _{r5} | 83.3 | 33.3 | 16.7 | 50.0 | 33.3 | 33.3 | 33.3 | 50.0 | 50.0 | 16.7 | 40.0 |
| RTC _{r6} | 100.0 | 0.0 | 0.0 | 50.0 | 50.0 | 0.0 | 50.0 | 100.0 | 0.0 | 0.0 | 35.0 |
| RTC _{r7} | 43.0 | 14.0 | 14.0 | 43.0 | 14.0 | 14.0 | 29.0 | 29.0 | 71.0 | 0.0 | 27.1 |
| RTC _{r8} | 66.7 | 0.0 | 33.3 | 66.7 | 66.7 | 33.3 | 33.3 | 0.0 | 66.7 | 33.3 | 40.0 |
| RTC _{r9} | 100.0 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 100.0 | 0.0 | 30.0 |
| Second Game | | | | | | | | | | | |
| RTC _m | 100.0 | 20.0 | 20.0 | 80.0 | 20.0 | 40.0 | 60.0 | 80.0 | 100.0 | 20.0 | 54.0 |
| RTC _x | 47.0 | 20.0 | 0.0 | 73.0 | 47.0 | 33.0 | 47.0 | 60.0 | 60.0 | 27.0 | 41.4 |
| RTC _{ie} | 100.0 | 0.0 | 0.0 | 100.0 | 50.0 | 25.0 | 50.0 | 100.0 | 75.0 | 25.0 | 52.5 |
| RTC _{nle} | 50.0 | 25.0 | 6.0 | 69.0 | 38.0 | 38.0 | 56.0 | 56.0 | 56.0 | 25.0 | 41.9 |
| RTC _{te} | 83.0 | 0.0 | 0.0 | 100.0 | 67.0 | 50.0 | 33.0 | 100.0 | 67.0 | 33.0 | 53.3 |

| Indicator Name | Indicator Value (%) | | | | | | | | | | Average Across All Rounds |
|--------------------|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------------------------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Round 6 | Round 7 | Round 8 | Round 9 | Round 10 | |
| RTC _{nte} | 50.0 | 29.0 | 7.0 | 64.0 | 29.0 | 29.0 | 57.0 | 50.0 | 71.0 | 21.0 | 40.7 |
| RTC _{r4} | 100.0 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 100.0 | 100.0 | 100.0 | 0.0 | 60.0 |
| RTC _{r5} | 83.3 | 33.3 | 16.7 | 100.0 | 50.0 | 50.0 | 100.0 | 66.7 | 100.0 | 33.3 | 63.3 |
| RTC _{r6} | 50.0 | 100.0 | 0.0 | 0.0 | 50.0 | 100.0 | 0.0 | 50.0 | 50.0 | 50.0 | 45.0 |
| RTC _{r7} | 57.0 | 0.0 | 0.0 | 71.0 | 29.0 | 14.0 | 43.0 | 71.0 | 57.0 | 14.0 | 35.6 |
| RTC _{r8} | 33.3 | 0.0 | 0.0 | 100.0 | 33.3 | 33.3 | 0.0 | 66.7 | 66.7 | 33.3 | 36.7 |
| RTC _{r9} | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Appendix H. Coding of variables used in the logit model. Notes: For binary variables, the reference categories were female gender, absence of investment experience, absence of prior tax evasion experience, and the control game without moral-ethical framing. Compiled by the authors.

| Variable Name | Coding |
|--|--|
| Tax compliance | 1 = full payment; 0 = incomplete payment |
| Moral-ethical framing of the experiment | 1 = second game; 0 = first game |
| Gender of the experimental participant | 1 = male; 0 = female |
| Investment experience | 1 = present; 0 = absent |
| Prior tax evasion experience | 1 = present; 0 = absent |
| Risk propensity level | Scale from 1 to 10 |
| Tax audit probability | Percentage |
| Penalty level | Percentage |
| Expected value of gains from tax evasion | UAH |