The impact of budget transparency on tax compliance

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Abstract. The article analyzes the factors influencing tax evasion: the value of gross domestic product per capita, tax burden, corruption and openness of information on the use of budgetary funds. The correlation model includes the analysis of two groups of indicators. The first group is indicators of the individual level: education, socio-economic status, attitude to religion, gender, etc. The second group is indicators of the global or national level: GDP per capita, tax burden, the level of corruption in the country, the degree of financial transparency of public finances. The results of the study confirmed the hypothesis that law-abiding tax behavior is largely determined by the openness of information about the use of tax revenues by governments. Disclosure of information on the use of budget funds can become a powerful tool for strengthening the understanding of the legitimacy of the state tax policy, as well as act as a preventive measure to overcome existing facts of tax evasion. Increasing the transparency of public finances will make it possible to reproduce a new level of tax culture, to form an internal agreement of citizens with the fiscal policy of the state.

1 Introduction

Tax evasion issues have been very relevant since the inception of the tax system. The factors that determine law-abiding tax behavior are not only economic, institutional, political, but social and moral factors, as well as the level of civil liability of the taxpayer. A wide range of moral and ethical attitudes that form the individual relation of a taxpayer to the obligation to pay taxes is tax morality. This term is described as combining non-economic motivational attitudes of the taxpayer [1]. Some authors in their works emphasize that one of the mechanisms for the formation of tax morality is tax relations that exist

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between tax authorities and taxpayers, forming law-abiding behavior or, on the contrary, leading to tax evasion [2].

The issues of trust in tax authorities, and through them trust in the government, satisfaction of taxpayers with the activities of the tax service [2], the ability to influence decision-making, the development of democracy and the rule of law, the level of corruption in the country, the level of tax morality are reflected in the works of such scientists as C. Daude, H. Gutiérrez, Á. Melguizo [3]. The problems of the effectiveness of public administration, trust in government, the fight against corruption and their impact on tax relations have attracted the attention of many scientists [4, 5]

The importance of informing taxpayers about the directions of using budget funds has already been noted in the works of scientists [6] and international organizations [7], such as the Global Initiative for Fiscal Transparency (GIFT). Nevertheless, the issues of studying the dependence of tax morality on the transparency of budget expenditures require additional study.

This article analyzes the factors influencing the increase of tax morality, determines the degree of influence of each. If taxes are a means to ensure public goods, taxation can be viewed as a social contract between the state and its taxpayers, according to which one party (taxpayer) undertakes not only to pay taxes, but also to receive information from the other party (state) on the use of budgetary funds. Thus, the dependence of tax morality and information transparency in expenditures of budget funds creates incentives for law-abiding behavior of the taxpayer.

To measure the degree of openness of government financial data, we use the financial transparency index (GFS-Index), which measures the level of accessibility and completeness of information on statistical data on the state of government finances in accordance with international standards [8].

The hypothesis of the study is that the availability of complete and reliable information on the expenditures of budgetary funds will contribute to an increase in the level of tax morality in society, since more transparent information raises less doubts about the rational use of taxpayers' funds by the state.

To establish the degree of influence of various factors on increasing the level of tax morality, we will build an empirical model that will allow us to establish a regression relationship between the measure of tax morality and indicators of financial transparency, and other socio-economic characteristics. For the analysis, we use a multilevel approach that will reveal the relationship between tax morality and the factors that determine it in different countries. Let us investigate whether the assumption is true that a higher degree of budget transparency is directly dependent on the tax morality existing in the country.

2 Materials and methods

Financial transparency shows how widely the government of a country provides its citizens with information about the use of budget funds: for what purposes and to what extent they are used. Seeking a universally recognized international standard The International Monetary Fund (IMF) has developed a code that aims to maximize the transparency and reliability of public finance reporting. The Code is based on the following main elements: tax reporting, tax forecasting, tax risk management analysis, resource revenue management, and a set of specific rules and practices [8].

According to the IMF, fiscal transparency improves public administration of budget funds and provides taxpayers with the necessary information to assess government performance. The adoption of the code is one of the priorities of government in many countries and indicates a trend towards a growing understanding of the role of financial transparency in enhancing the credibility of government authorities in a given country.

Open information about the formation of the state budget and a transparent decision-making process on their use contributes to the improvement of tax relations, exerting a stimulating effect on taxpayers, and forms a high tax morality.

Taking into account the multidimensionality of factors affecting tax morality, we define a multi-level model that takes into account the individual specific characteristics of the taxpayer and variables at the country level [9].

Differences in the individual attitude to the tax burden can be explained by two dimensions: the first dimension is the individual level (X), concerning such characteristics as education, socio-economic status, etc.; the second dimension is the global level or the level of the country (Y), which includes such characteristics as GDP per capita, tax burden, level of corruption, and the degree of transparency of public finances.

The empirical model will be constructed as follows: first, let us measure the variance of the dependent variable described at the country level:

$$y_{\ddot{y}} = \beta_{oj} + \varepsilon_{\ddot{y},} \tag{1}$$

where

$$\beta_{oj} := \beta_{o+v0j}, \tag{2}$$

In this formula:

$y_{\ddot{y}}$ is dependent variable (tax morality) for the y-th individual in country j,

β_{oj} is average tax morale for all taxpayers in all countries,

β_{o+v0j} is an individual error characterizing individual deviations from the mean of the j-th country.

Based on this formula, let us designate X as variables of the first level or individual level, Y as variables of the second level (country level). Then the model can look like this:

$$Y \text{ program } ij = \beta_{oj} + \beta_1 x \text{ program } ij + E_{ij} \tag{3}$$

where

$$\beta_{oj} = \beta_o + \beta_2 Z_j + U_{oj}, \tag{4}$$

Substituting Formula 4 into Formula 1, we get a model of the following form:

$$y_{\ddot{y}} = \beta_o + \beta_1 + \beta_1 X_{ij} + \beta_2 Z_j + \varepsilon \ddot{y}_{+} U_{oj}, \tag{5}$$

The empirical model obtained by us consists of a set of variables of the individual level X, as well as a set of variables characterizing the fiscal features at the level of country Z. The use of a multi-level model allows us to obtain information about the degree of influence of various factors on the level of tax morality. The constructed model and the further analysis made on its basis is an attempt to find a conditional correlation dependence between the variable and the factors influencing it. The analysis performed makes it possible, with a certain degree of probability, to reveal whether there is a connection between fiscal transparency and the absence of tax evasion (tax morality).

3 Results

The analysis examines the data obtained for the time interval 2007-2017, calculated as the arithmetic mean for each country participating in the study. The observation was carried out in 40 countries that vary from points of view of socio-cultural traditions, the level of economic development, and state structure. The value of the tax morality index was obtained from a study by Salvatore Capasso, Lorenzo Cicatiello, Elina De Simone, Giuseppe Lucio Gaeta, Paulo Reis Mourão [10]. Tax morality is a category that is difficult to measure. The existing methods are not perfectly reliable. In particular, if we measure tax morality by assessing the deviation of the actual from the expected level of tax evasion, then this method will allow us to obtain average information about the level of tax morality in a particular country [11], which is sufficient for the purposes of our study. The table presents summary statistics at the country level for the indicators used in the analysis (Table 1).

To measure fiscal transparency, we will use the fiscal transparency index proposed by R.F. Wang, M.T. Irwin, L.K. Murara [12]. The index is based on annual government finance statistics (GFS). GFS is compiled on the basis of reports of the statistical department of the International Monetary Fund and characterizes the level of disclosure of information by governments of different countries about the sources of budget funds and the directions of their use.

The tax morality index takes into account the indicators of the individual level. The attitude of a taxpayer to the fulfillment of a tax obligation is formed on the basis of various socio-demographic factors: gender, age, marital status, education level, taxpayer status (individual entrepreneur, individual, representative of an organization, etc.), social status, individual attitude to fulfillment tax liabilities. The index that we are using includes all of these parameters [10]. This information was obtained from sociological surveys in the context of countries and indicates that women are more responsible in fulfilling tax obligations [13].

The relationship between education and responsible taxpayer behavior is highly controversial. On the one hand, more educated people are better versed in tax legislation, are able to optimize their tax payments and carry out tax planning within the framework of the rule of law. Also educated people are aware of the need to pay taxes to finance government expenditures and public goods. On the other hand, more educated people have their own idea of the effectiveness of the use of budget funds and are sometimes critical of the obligation to pay taxes. In addition, a high level of education can lead to higher income, which in theory should stimulate law-abiding tax behavior.

In general, there is no consensus in the scientific literature on the relationship between the socio-economic status of a taxpayer and tax morality. On the one hand, people with a higher income, assessing tax risks, avoid situations where the likelihood of applying tax sanctions is minimal [14]. On the other hand, the potential for a decline in business reputation presupposes law-abiding tax behavior.

The indicator of tax morality should also take into account such indicators as the attitude of citizens to their state, national pride, the level of democracy in the country. National pride not only increases morale, but also positively influences tax behavior. Since in democratic states, citizens have the opportunity to independently participate in the formation of government, it can be assumed that the level of development of democracy has a positive effect on tax morality. Some researchers believe that religiosity has a positive effect on fulfilling the duty of a taxpayer [15], therefore, in the indicator of tax morality we used, attitude towards religion was also taken into account.

The indicator of the level of GDP per capita largely shows the standard of living in various countries. We cannot argue that there is a strong relationship between income level

and attitude towards taxation, yet the evidence suggests that people living in countries with high GDP per capita have low level of tax morality.

Table 1. Average value of factors in the context of countries (construction of an empirical model).

Countries	Average deviation of tax morality Y	GFS Index X1	Corruption level in the country X2	Tax revenue in % to GDP X3	GDP per capita X4	The tax burden X5
Algeria	7.12	5.56	-0.47	27.58	3975.23	8.65
Azerbaijan	9.49	16.67	-1.12	12.16	5842.8	39.25
Australia	9.1	83.33	1.99	22.43	50001.38	70.31
Poland	8.6	33.33	33.3	17.06	11962.09	27.34
Peru	9	44.44	-0.39	13.41	3519.4	30.64
Bulgaria	8.6	16.67	0.59	20.94	5678.04	23.1
Russia	7.97	100	-1.06	14.05	11212.51	3.63
Switzerland	8.92	33.33	2.09	9.88	31394.89	39.3
Sweden	8.81	50	2.21	27.11	50923.17	17
Turkey	9.7	66.67	0.05	20.38	10851.23	29.98
Finland	8.86	50	2.35	21.85	44280.48	36.17
Singapore	8.45	33.33	2.17	11.69	38117.41	44.6
Slovenia	8.94	16.67	0.9	18.04	23141.31	22.15
Romania	8.81	33.33	-0.23	17.15	62060.25	33.98
The Philippines	7.2	5.56	-0.58	12.23	2023.5	44.35
New Zealand	8.98	66.67	2.39	30.68	33257.23	65.02
Norway	2.85	83.33	1.97	28.2	88519.09	95.67
Netherlands	8.97	50	2.14	20.98	49900.1	47.47
Cyprus	9.21	0.99	0.99	44.31	31815.33	38.2
Canada	9.19	33.33	1.96	13.39	46169.25	73.84
India	7.97	27.78	-0.28	8.95	859.34	41.26
Italy	8.82	16.67	0.4	22.38	38239.07	56.24
Hong Kong	9.01	100	1.64	13.94	31081.57	57.57
Germany	8.96	1.79	1.79	10.6	38971.64	30.39
United States	9.12	54.89	1.28	9.43	47177.01	90.45
Japan	9.64	100	1.46	9.07	44970.74	46.04
China	8.91	5.56	-0.6	10.49	4142.04	27.79
Chile	9.17	33.33	1.4	15.99	12502.43	35.18
Spain	9	50	1.02	14.59	31394.89	40.71
South Korea	9.29	8.33	0.5	14.17	21524.35	42.2
Estonia	8.74	50	0.93	1.27	12481.93	40.45
Kazakhstan	8.41	33.33	-0.98	13.08	6107.71	45.18
South Africa	7.61	33.33	0.13	14.17	7434.36	55.66

Tax revenue as a percentage of GDP. On the face of it, tax revenues should increase with an increase in GDP. A high level of GDP enables the government to provide more public goods to its citizens. Consequently, taxpayers, seeing the efficiency of taxation, will

be more loyal to their tax obligations, but with ineffective use of budgetary funds, when the state does not fulfill its obligations to provide the proper level of social benefits [16], a high level of tax collection may be accompanied by a decrease in tax morality. A low level of tax morality can lead to a decrease in tax collection, hence, to a decrease in budget revenues.

The level of corruption in a country can have a significant impact on the level of tax revenues [17]. Corruption contributes to a decrease in citizens' trust in state institutions, forms a negative attitude towards power structures, decrease the level of tax morality [18]. We use the World Bank's Corruption Control Index as a indicator of corruption.

Analysis of the data obtained shows that the average level of deviation from tax morality, calculated by countries, ranges from 8 to 9. Norway has the lowest indicator - 2.85. In general, in many countries, taxpayers are of the opinion that tax evasion is a debatable issue and in the absence of significant tax risks it is quite acceptable to optimize their expenses through taxes [19]. The results obtained indicate the heterogeneity of cross-country indicators. The study of the nature of tax morality, perhaps, will explain this heterogeneity (factors influencing tax morality, Table 2).

Table 2. Description of the first level variables.

	Social factors	Description variable	Designation variable	Coefficient correlations
1	Gender	Female Male	0.5	16.7
2	Age	18-35 36- 50 50-65 66 and more	0.2	0.5
3	Family status	Married Not married	0.5	0.44
4	Level of education	Secondary Higher Two higher and more	0.33	0.44
5	Relation to religion	Atheist I respect the feelings of believers Deeply believer	0.33	0.42
6	Attitude towards democratic values	I support democracy I negatively assess the presence of democracy in the country	0.5	0.72
7	Patriotism	I'm sorry to live in this country I am proud to live in this country	0.5	0.9
8	Social status	Working Middle class Upper class	0.33	0.43

In our study, we used two-level models. Level 1 consists of a set of variables of the individual level X - this is gender, age, attitude to democracy, etc., level 2 consists of a set of variables characterizing fiscal features at the country level, including GDP per capita, tax burden, level of corruption in the country, etc.

Analysis of the first level variables shows that women have higher tax morality, and the female sex has a positive correlation with age, education, national pride, supporting democracy and being married. The absence of marriage bonds shows a negative correlation

with tax morality. The dependence of tax morality on social status is ambiguous: people with secondary education demonstrate low tax morality, however, those who have one or more higher education demonstrate high tax morality. Church membership is associated with high tax morality. The first level model showed the expected results and confirmed our hypothesis.

Next, let us consider second model, which describes the level of influence of country-level factors on tax morality. For the analysis, we use the indicator named "average deviation of tax morality", measuring the influence of factors on the deviation from the norm, from the conscientious fulfillment of the taxpayer's obligations. In our model, the coefficient of budget transparency has a negative value, which means that with an increase in the openness of budget expenditures, the average deviation from tax morality decreases, i.e. a higher degree of financial transparency is associated with a higher level of tax morality [20]. The obtained result confirms that the disclosure of information on the expenditure of budgetary funds has a significant impact on the attitude of citizens to tax obligations. This circumstance is a factor in the formation of a high tax culture and increasing the legitimacy of the authorities.

Table 3. Regression coefficients of the empirical model with R squared equal to 0.6.

No.	Variable	Regression coefficient
1	y	0.7
2	X1	- 4.7025
3	X2	1.0235
4	X3	- 2.5445
5	X4	- 3.9001
6	X5	- 1.4155

The dependence of variable on other factors not described in the model (Y value) in our model (Table 3) is a significant value of -0.7, which allows us to conclude that not all the factors we have considered influence on tax morality, these are factors such as the level of tax administration digitalization, the effectiveness of tax audits, and much more that needs to be considered in our future research.

The indicator of GDP per capita has a positive effect on tax morality and has a negative impact on tax evasion (deviation from tax morality). With an increase in the GDP indicator, the tax morality index shows an increase.

Corruption associated with ineffective use of budget funds, abuses, and arbitrariness of officials leads to a decrease in tax collection, undermines citizens' confidence in the state (Fig. 1), while an increase in the tax burden negatively affects tax morality (Fig. 2).

In our study, there is the possibility of not only direct, but also reverse causation. It can be argued that a high level of tax morality forms budget transparency, since law-abiding taxpayers may require disclosure of information on expenditures of budget funds, on the amount of public goods provided. On the other hand, a broad presentation of information about the fair expenditures of budgetary funds encourages taxpayers to fulfill their obligations to the budget, which is confirmed by other studies [21].

The analysis showed that the tax transparency index has a positive impact both on those respondents who rated the level of their tax morality on a scale of 1-10, and on those who gave themselves a rating of 9-10 points. A deeper analysis should take into account the fact that conscientious taxpayers (9-10 points) may be less sensitive to changes in the breadth of government reporting on budget expenditures. On the contrary, citizens who justify tax evasion can change their position if open information demonstrates the effectiveness of the use of budget funds.
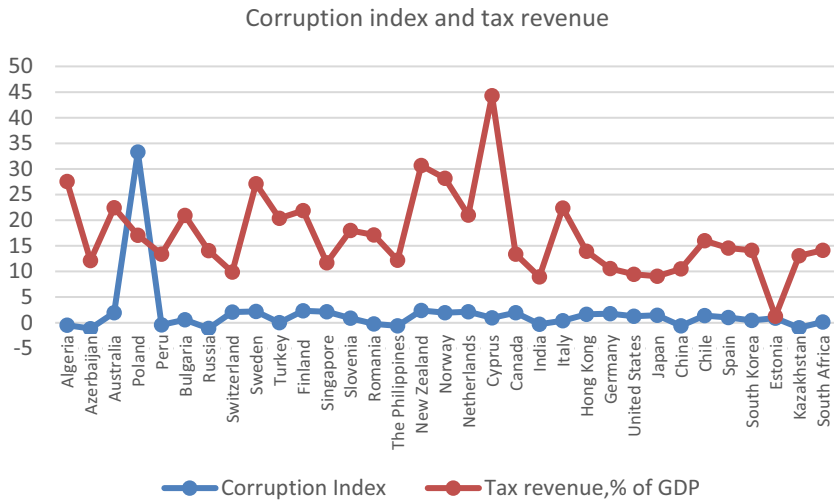
Fig. 1. Comparative characteristics of the dependence of the amount of tax revenues and the level of corruption in different countries.
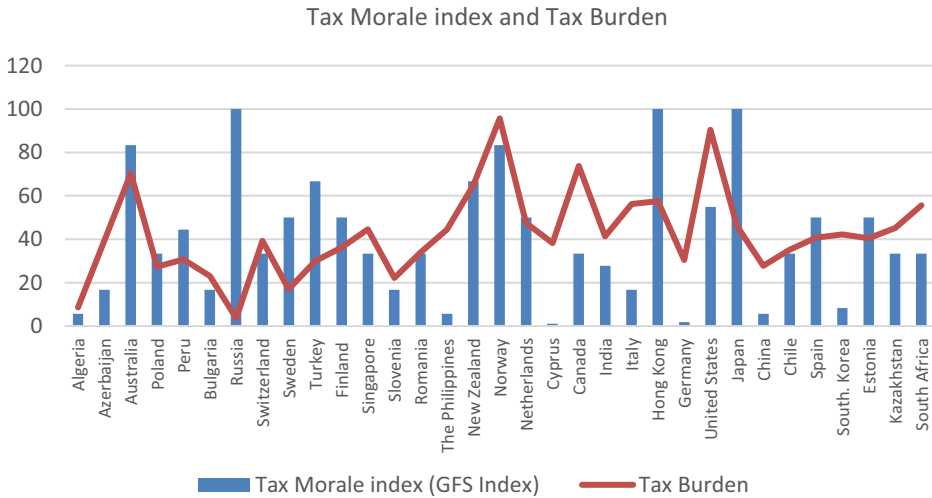

Fig. 2. Dependence of the tax morality index on the level of tax burden in different countries.

4 Conclusions

Disclosure of information on the use of budget funds can be a powerful tool in strengthening understanding of the legitimacy of government tax policy. It can serve as a preventive measure to overcome the existing facts of tax evasion. It will allow to reproduce a new level of tax culture, to form internal agreements of citizens with the fiscal policy of the state.

The presence of a positive relationship between tax morality and budget transparency shows that taxpayers are less evasion when they are aware of what the tax withdrawn from them is spent on. This situation forms the partnership between the actors of the tax process.

Partnership interaction means that taxpayers pay taxes in full, without using illegal tax optimization, and civil servants provide quality services for the calculation and payment of tax payments. The parties of tax relations by their actions contribute to the implementation of tax legislation, full and timely receipt of tax payments to the budget. The parties have a sense of satisfaction that the public goods they receive, which are paid for by taxpayers, are provided in the required volume and of the appropriate quality.

The existing digitalization tools used in tax administration already largely deprive the taxpayer of the opportunity to evade tax. However, issues of law-abiding behavior are not only an economic but also a moral problem. Paying attention to improving tax morality is necessary to ensure the legitimacy of the authorities, to create an atmosphere of citizens' trust in their government.

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