



# VIRTUAL MOBILITY (VM) GRANT REPORT

**VM grant title: Using Machine Learning Techniques to Assess Taxpayers' Perception**

**VM grant start and end date: 30/09/2021 to 30/10/2021**

**Grantee name: Codruta MARE**

## 1. One paragraph presentation of your VMG

The main objective of the VMG is to evaluate **taxpayers' perceptions at an international level**, by evaluating factors that influence the attitude towards paying taxes, using Machine Learning techniques (such as Natural Language Processing – sentiment analysis). A secondary goal for the fulfilment of the main objective (and running this **perception** analysis) is the consolidation of an international research team on the subject. A questionnaire was constructed and distributed through the CA 19130 members, internationally, to their peers, in order to be able to address and map similarities and differences in perception at the national or regional level. For this, spatial econometrics tools will be employed in addition to the ML ones. Results will be presented in the form of a descriptive report, map analysis, and research articles in top-tier journals.

The goal of this VMG combines several objectives of the CA 19130, such as: (1) **putting together academia and the public, for a cross-country assessment in Europe** in order to (2) **transfer knowledge and help authorities** make more (3) **transparent decisions** in respect to taxes, and (4) using **AI** techniques.

## 2. Main activities performed

The main research team was formed, made up by Prof. Codruta Mare (BBU, RO), Prof Florentina Paraschiv (Zeppelin Universitat and NTNU, DE & NO), Assist. Researcher Ioana Coita (Oradea University, RO) and Assoc. Prof. Ranik Raaen Wahlstrom (NTNU, NO).

Online meetings for discussing the final form of the questionnaire: there were several online meetings to discuss the questions to be included in the questionnaire, out of which two main ones:

- 11.10.2021 – a Zoom meeting with the entire team in which the final form of the questionnaire was discussed. Additionally, there were treated subjects like the role of each member in the team, possible methodological approaches,



publication opportunities, future developments and the possibility to apply for research missions grants in order to physically meet for conducting the research.

- 12.10.2021 – a Zoom meeting only with Ioana Coita for the final formatting of the questionnaire.

The questionnaire was distributed online to the Action's members, peers and friends, students, etc., through e-mails. In some cases, it was also posted on Moodle or other educational platforms for students.

The questionnaire was also promoted through the Action's social media pages (Facebook, LinkedIn, etc.) and through the personal social media pages of the team members.

Continuous monitoring of the survey and the responses obtained.

Descriptive analysis of the partial results obtained:

The majority of the sample are females and live in cities. Age ranges from 19 to 60. On a scale from 1 to 10 (1 lowest, 10 highest), approximately 30% of the sample has attached a value of 8 for the contribution of the Tax System to the socio-economic development, while another group of almost the same share considers this contribution as very high/ important (the attributed values are of 9 and 10 in approximately equal shares). Some differences among countries may already be depicted: while the French, for example, trust more their national Tax System, the Romanians have a lower trust level. This difference can also be seen through the fact that transparency is the most important aspect for the French respondents, the Romanian ones put high value on the trust in the national Tax System.

Presentation of the VMG in a podcast made by Mr. Vasile Strat.

### **3. Main results/outcomes obtained (also please explain how each has contributed to the Cost Action Objectives) \* also touch on the points below**

Formation of a research team to assess the issue of taxpayer's perception internationally. Other researchers have already expressed their interest in joining the team and contributing to the future development of this research.

A data base made up of 367 respondents.



A descriptive report of the information provided by the database, with analysis on the countries for which responses were obtained (27 countries)

A podcast with Mr. Vasile Strat, in which the VMG was presented and is available online at: <https://www.youtube.com/watch?v=5U3wZBBMZMg&t=1s>

Progress towards the Action objectives and deliverables.

Activities of this VMG are in line with CA 19130 objectives and goals. First, we use Machine Learning techniques to evaluate taxpayers' perception and the determining factors. Second, results of the VMG help authorities to identify problems that exist in the tax system from the point of view of the taxpayer. An interesting result, closely related to the goals of the CA 19130, is that more than 50% of the respondents consider **transparency** as a very important aspect related to the national/ local Tax System, while approximately 53% of them claim that an increase in the transparency of how public money is spent is very important. The issue of transparency appears in the goals for the 1<sup>st</sup> Grant Period for all the three working groups of the Action.

The VMG's secondary goal is related to the main objective of any COST ACTION – sustain the formation of international research teams. In this case, the main research team was constructed and interactions among the members intensified.

The final results of this VMG will be presented to conferences and workshops, on one hand, and, on the other, we intend to publish them in top-tier journals.

The results obtained up to now and the goals of the VMG are in line with both the CA 19130 objectives, research coordination and the capacity building strategy, as stated in the MoU. Additionally, it contributes to and sustains the European Commission's strategy to sustain ML/ AI developments for a better financial environment, as it treats the very delicate issue of taxation and trust in the Tax System.

COST Excellence and inclusiveness Policy, especially towards the support of researchers in COST Inclusiveness Target Countries

In terms of **Excellence**, the research will bring high value added to the field's literature, by filling the identified gaps and contribute to the increase in transparency. Very good publications with the CA 19130 logos will increase the visibility and performance of the Action. Among the most important benefit and contribution I consider to be the consolidation of a research team able to work together for long-term and develop more activities from the present proposal. The research idea is originated in an **ITC** country, Romania, on which 2 members of the team activate (Prof. Codruta Mare and Assist. Researcher Ioana Coita) and where the



testing of the questionnaire took place. Thus, this VMG helped researchers coming from ITC countries (Romania) connect to researchers from more developed countries in order to increase their performance and boost research. This VMG deals with another important aspect of the Action, **diversity** – (1) three of the four members of the research team are females, while (2) two of the members are ECIs (based on the GP1 Cost rules; all four members are ECIs if we consider the new Cost rules).

Stakeholder engagement and promoting participation of researchers from NNC and IPC (COST Global Networking)

The questionnaire was sent to all CA 19130 members, including those from NNCs and IPCs. The descriptive report will be provided to authorities in order to increase transparency of the decision-making process in respect to taxation.

**4. What else do you expect to achieve until the end of the VMG?**

More international responses to be obtained in such a way as to be able to map similarities and differences in taxpayers' perceptions in the CA countries.

**5. Activities and results checklist**

Activity/Result according to VMG accepted proposal	Completion level
Construction of an international research team	Completed
Online meetings for questionnaire construction	Completed
Distribution of the questionnaire by e-mail to the CA 19130 members, their peers, students, friends, etc.	Completed
Promotion of the questionnaire using the social media pages of CA 19130	Completed
Descriptive analysis of the database	Partially completed – because the survey process is still open and we keep receiving answers.
Presentation of the VMG in video/ podcast	Completed
Publication of results in top-tier journals	In progress as we are in the process of analyzing the data
Application of ML techniques to evaluate taxpayers' perception	In progress
Public descriptive report	In progress



Creating a map of similarities and differences in respect to taxpayers' perceptions in the CA 19130 member countries and not only, by using spatial analysis techniques

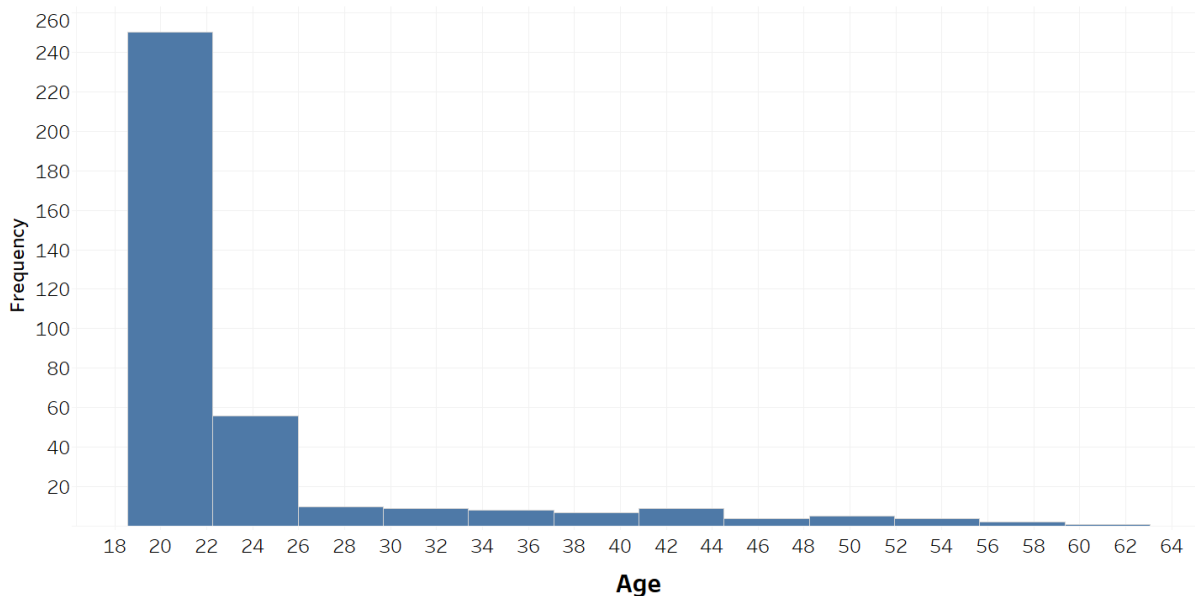
In progress, as we are waiting for more answers to be able to cover more countries. Up to now we have respondents from 27 countries.

**\*\*Also, include in this section the successful practices and the most important lessons learned**  
The online environment helps people from different countries get into contact and start working together, so through this VMG I got to find the advantages of such a networking tool. That is why I hope it will continue, in order to give other researchers such an opportunity.

Hereinafter, please find a synthesis of the descriptive analysis of the database up to the moment of this report. The analysis procedures were conducted in Tableau 2021.2.

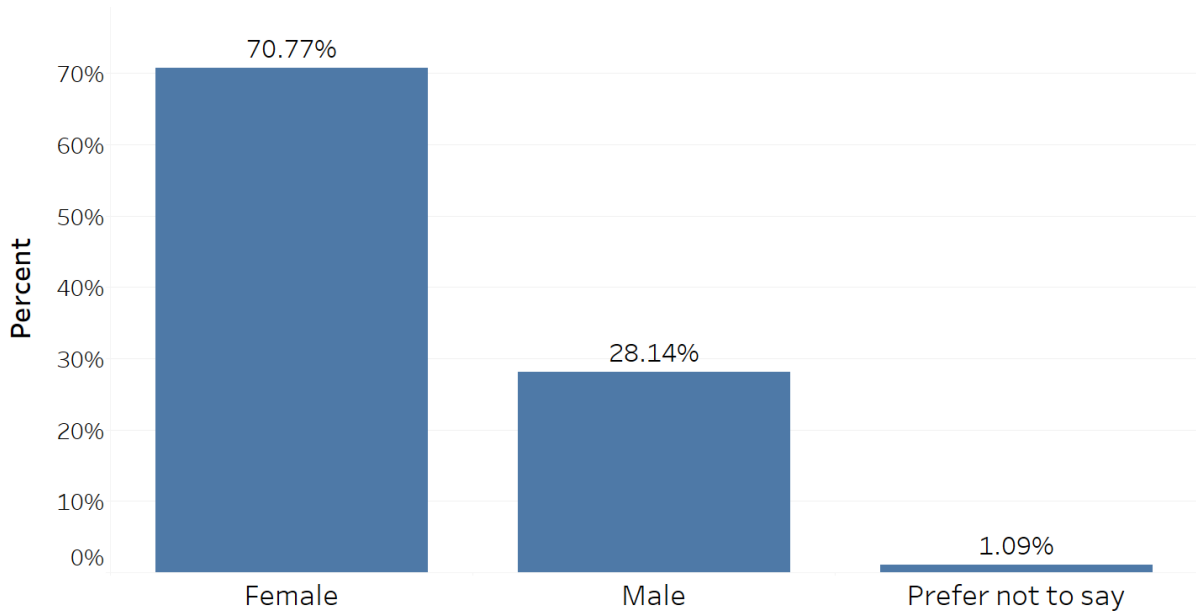
### Demographics:

Distribution of the sample based on age

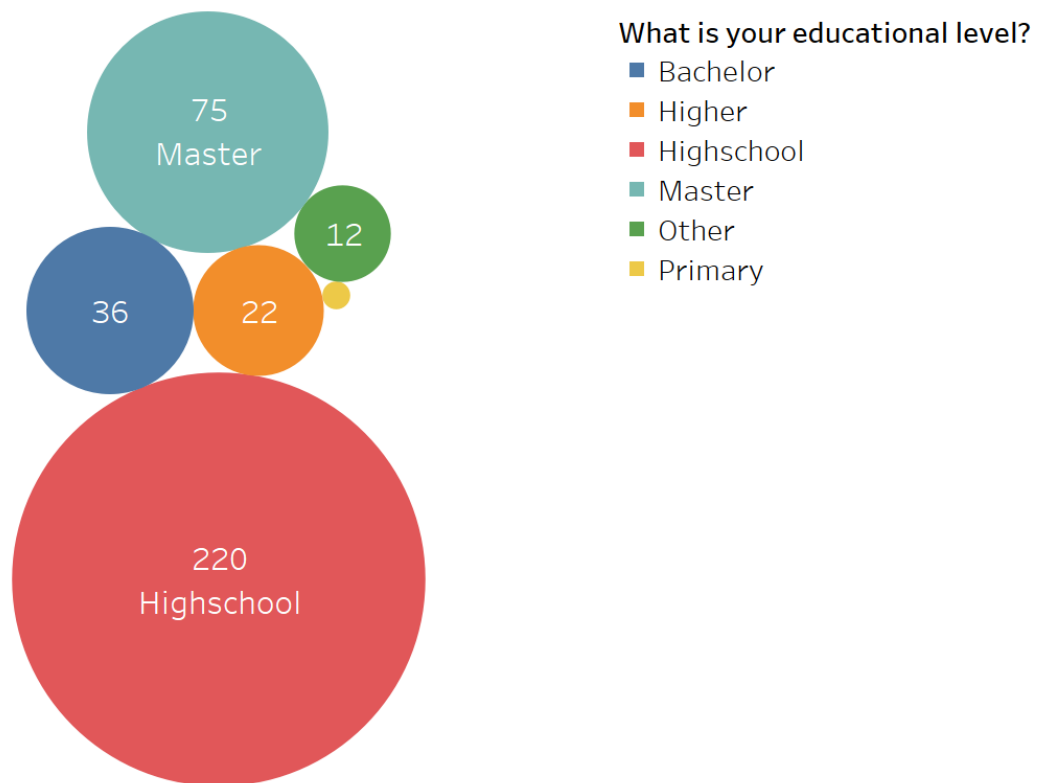




Distribution of the sample based on gender

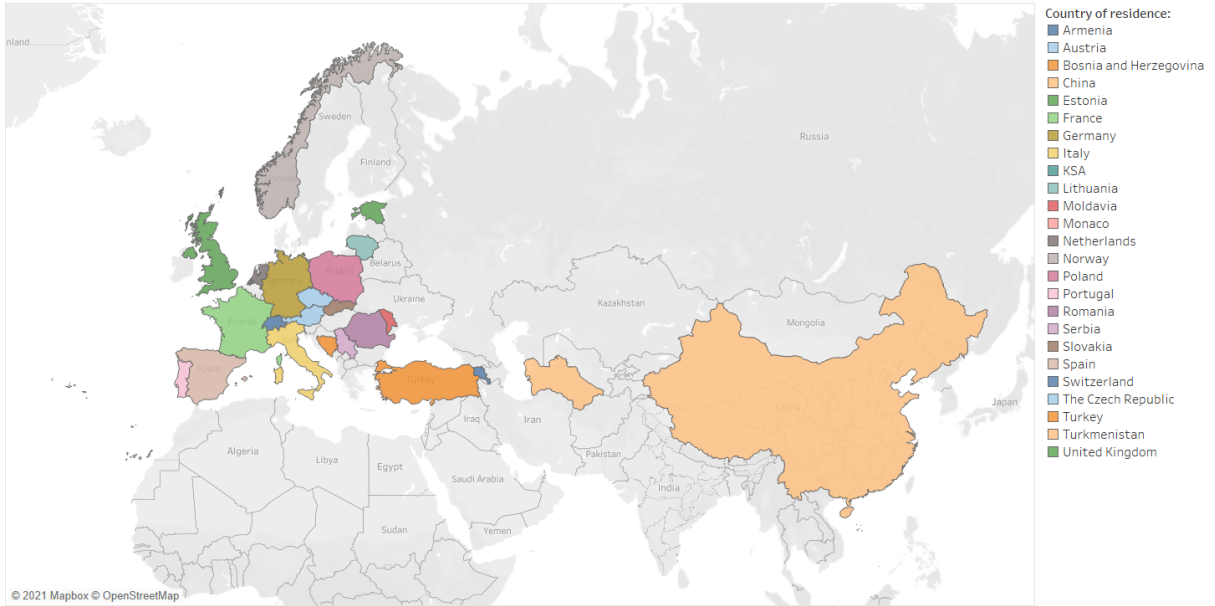


Education



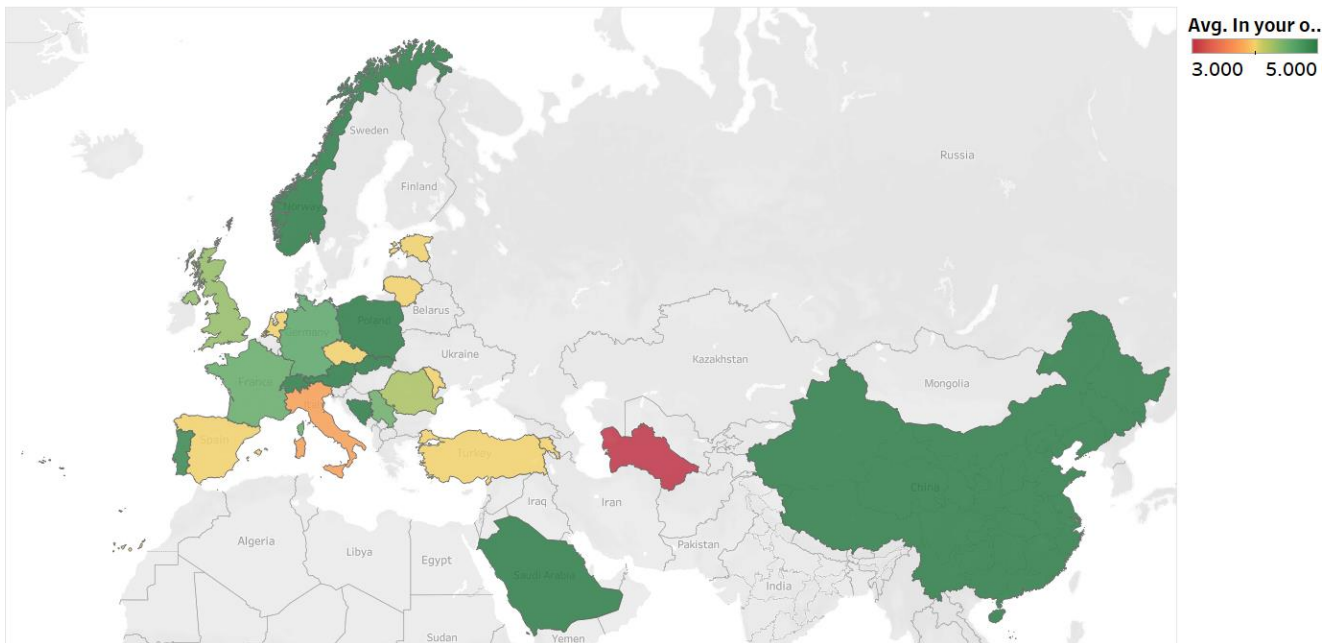


Countries



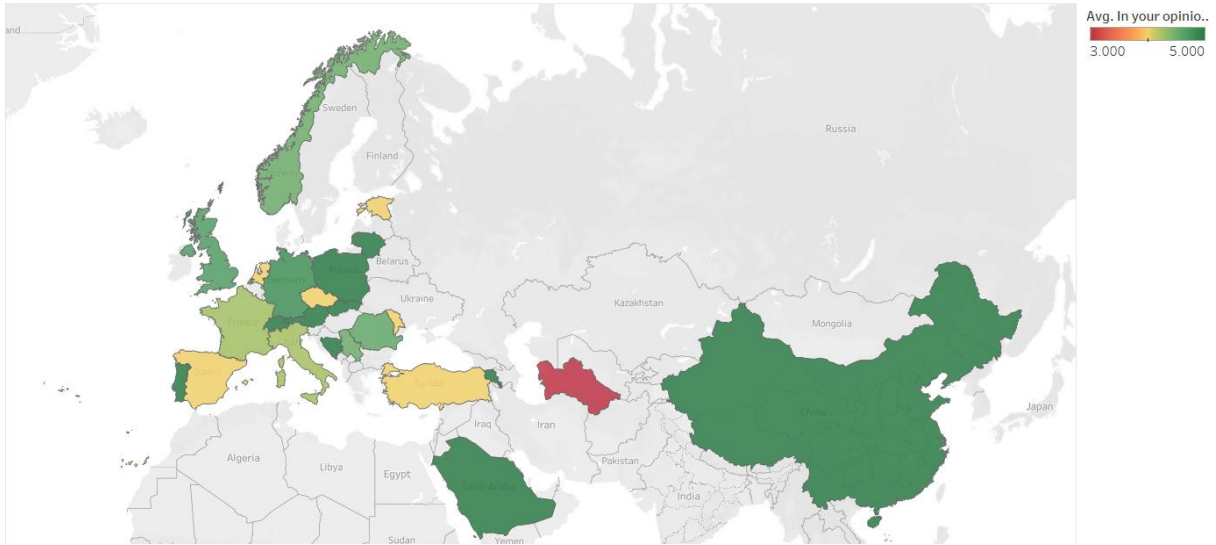
Taxpayers' perception:

Importance of Transparency for the Tax System



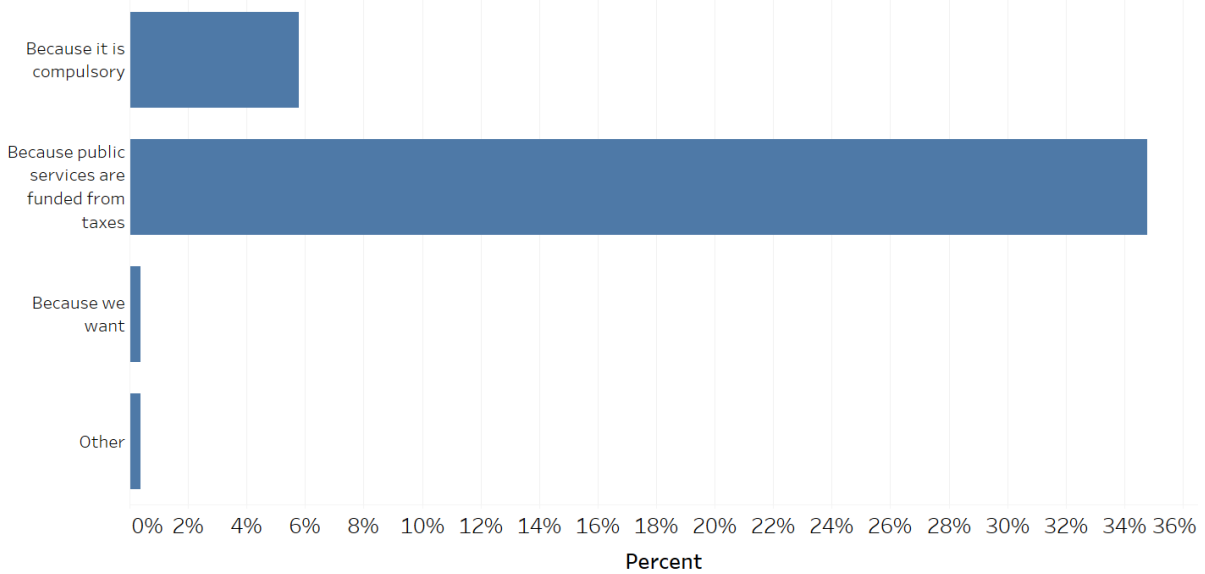


## Importance of Trust for the Tax System



## Why do we pay taxes?

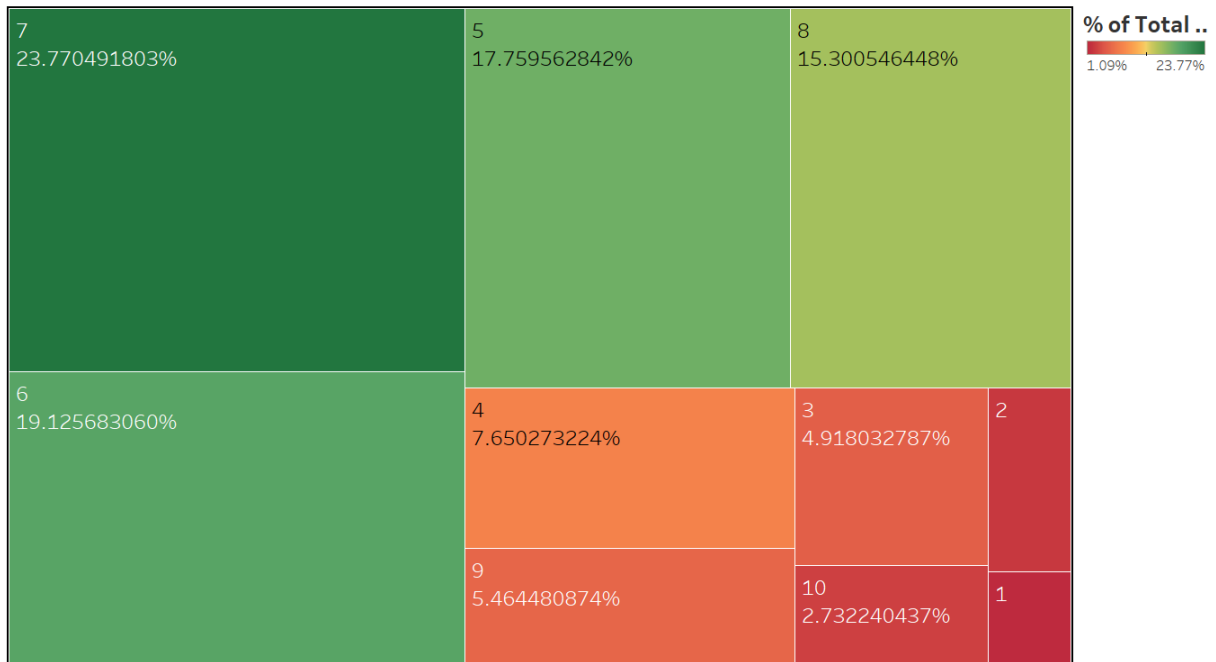
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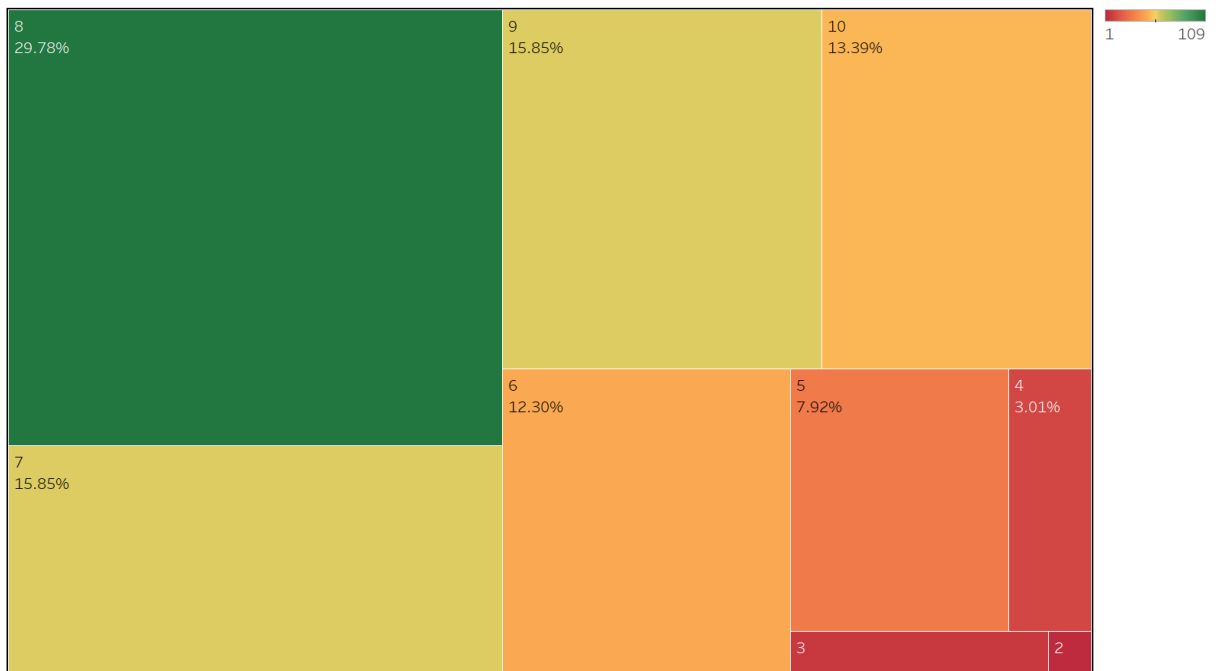




### Opinion on the national Tax System (1=very bad, 10=very good)



### Do you think that the fiscal system has a contribution to socio-economic development? (1 - not important, 10 - very important)





Increasing the degree of transparency enhances tax compliance

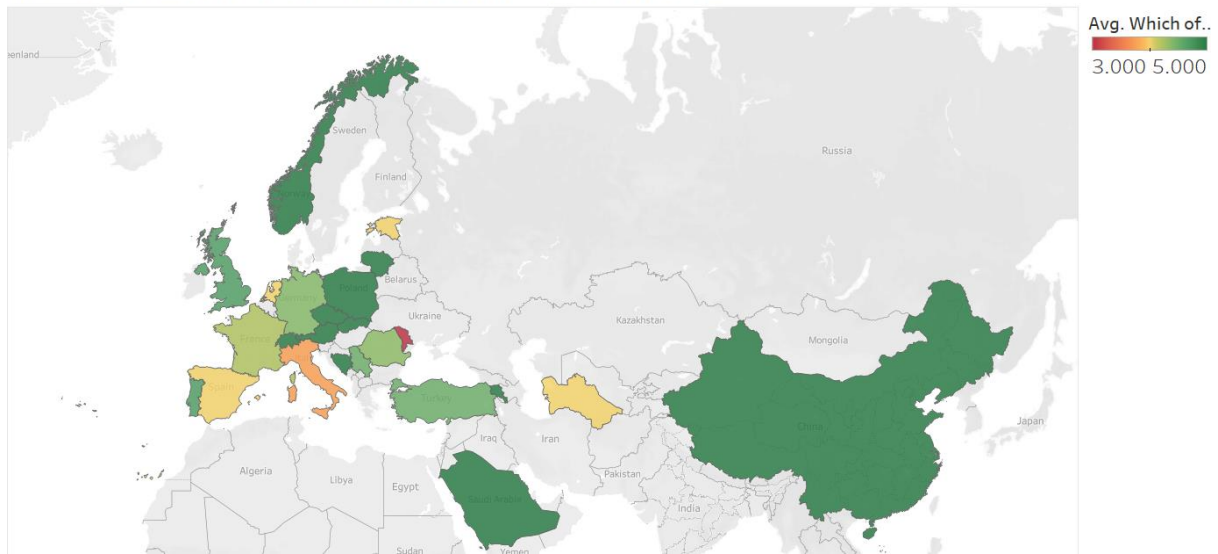


Table 1. In your opinion, how important are these aspects for a Tax System? (average score)

Aspect	Gender		
	Female	Male	Prefer not to say
<b>Economic Efficiency</b>	4.127	4.214	4.250
<b>Social welfare</b>	4.205	3.961	3.250
<b>Socio-economic development</b>	4.375	4.223	3.750
<b>Stability (Political)</b>	4.440	4.146	3.750
<b>Transparency</b>	4.259	4.456	4.750
<b>Trust</b>	4.544	4.485	4.750
<b>Workplace creation</b>	4.220	3.845	3.000



Table 2. Which of the following measures you think could enhance tax compliance? (average scores)

Where do you live?	City			In between			Rural	
	Female	Male	Prefer not to say	Female	Male	Prefer not to say	Female	Male
<b>A clearer record of all taxpayers' payment obligations</b>	4.039	4.076	3.667	4.063	4.250	5.000	4.159	3.813
<b>Building a climate of trust between the citizen and the state</b>	4.426	4.215	4.667	4.500	4.375	5.000	4.568	4.063
<b>Exemption from taxes related to the realization of some investments</b>	3.819	3.772	3.333	4.125	3.375	5.000	3.841	3.375
<b>Fiscal inspections at shorter intervals</b>	3.748	3.747	4.000	3.750	3.625	1.000	3.670	3.313
<b>Higher fines for non-payment of due tax obligations</b>	3.555	3.747	4.000	3.750	3.375	5.000	3.443	3.438
<b>Increasing the degree of transparency regarding the way public money is spent</b>	4.323	4.304	4.333	4.688	4.500	5.000	4.398	4.250



<b>Making the necessary public investments for socio-economic development</b>	4.232	4.063	3.333	4.500	3.750	5.000	4.216	4.125
<b>Providing quality public services</b>	4.406	4.139	4.000	4.500	4.000	5.000	4.432	4.313
<b>Tax facilities for the advance payment of taxes</b>	3.897	3.873	3.000	4.188	4.000	5.000	3.784	3.750
<b>Tax subsidies for employers who create new jobs</b>	4.000	3.835	3.667	4.250	4.000	5.000	4.080	3.813