

Testing Policy Options to Fight Tax Evasion using Behavioural Insights

Comparative results of behavioural experiments conducted in Moldova and France

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18 February 2020

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Executive Summary

Tax evasion in Moldova

The shadow economy in Moldova has reached the point where it has a very strong and persistent negative impact on the tax revenues, but especially on the economic growth. It placed Moldova among the countries with the highest level of shadow economy in the region. In recent years, the shadow economy in Moldova has been steadily growing and spreading, affecting increasingly the development of the economy. The immediate effects of tax evasion are related to forgone losses to the state budget (fiscal discrepancy). The large size of the shadow economy is mainly due to weak institutions, characterized by limited administrative abilities in the public sector to coordinate and manage the economic system and the relationships that characterize it. In addition, it is caused by perceptions about high fiscal pressure, complexity and instability of fiscal regulations, weakness of the tax administration, moral hazards and contagion (when some individuals observe the behaviour of other individuals and try to replicate for financial gains). In order to properly address this issue in a sustainable way, the policies, so far did not take into account the behavioral insights – the social norms and psychological factors that explain tax evasion in Moldova. This study comes to fill this gap by providing the necessary analytical framework that explains the tax evasion from the behavioral point of view and provides policy recommendations in this regard.

Tax morale in Moldova: Some surprising results

Tax morale is defined as the moral obligation to pay taxes in the absence of any economic incentives. In any country, tax compliance is the result of both voluntary compliance and enforcement. Using economic experiments conducted in controlled laboratory conditions, we isolate the effect of tax morale from the effect of economic incentives. What is more, by comparing tax evasion rates using economic experiments in Moldova and in France, we study whether the relative importance of the shadow economy in Moldova compared to western countries is the result of a lower tax morale or is due to some other factors. The results from the laboratory experiments conducted with more than 400 participants indicate that tax morale is higher in Moldova than in France, holding the institutional quality constant. More specifically, assuming that citizens in both countries face good institutions, we find that the voluntary compliance with tax laws is higher in Moldova. Hence, using a new method of causal inference that enables us to measure tax morale, we find that the prevalence of the shadow economy is most likely due to weak institutions than to low intrinsic motivations to comply with tax laws in Moldova.

The key role of social information

Tax morale is not a stable behavioral trait. In fact, tax morale is affected by a number of factors such as beliefs about what others approve of or about the tax compliance of the majority in one's community. Tax authorities can affect citizens' beliefs and thereby alter their decision to declare taxable incomes. The experiments conducted in Moldova and France clearly show the impact of social information on tax compliance rates. In our study, individuals observe positive (tax compliance) and negative (dishonest) behaviors. The data show that observing negative behaviors has a larger impact than observing positive behaviors. If individuals observe some dishonesty, this acts as a moral licensing effect, inducing people to engage in more tax evasion. Thus, people infer the extent to which tax evasion is morally reprehensible from the behaviour of others. These results suggest that tax authorities should engage more with the citizens via public information campaigns, carefully providing positive information (for example, by emphasizing the number of tax compliers in some community or any other positive information that could induce citizens to update their beliefs about the prevalence of tax evasion in their community). This policy can be complemented by the

implementation of whistleblowing. If negative information flows within a community and its members can report those who under-report income to tax authorities, then our experiments suggest that this could drastically reduce the frequency of tax evasion.

The effects of detection and penalty

Economic models of tax evasion predict lower tax evasion with lower tax rates, higher probability of detection and/or higher penalties. Tax rates are usually considered to be defined within what is called a *social contract* that is slow to evolve over time. That is, tax rates can be viewed as given (as a parameter). The only variables under public authorities' control, in the short run, are the probability of detection and the severity of penalty. According to standard theories of tax enforcement, tax authorities can save resources on detection (which is extremely costly) by increasing the severity of penalty. The extreme case is when the probability of detection is close to zero while the penalty size approaches infinity. The experiments conducted in Moldova and in France test the enforcement hypothesis by varying the probability of detection and the severity of punishment. The data indicate that the optimal policy is when public authorities implement a balanced combination of the probability of detection and penalty size. The two are therefore complements rather than substitutes. In other words, the experiments suggest that the Government should not increase neither the penalties, nor the number of fiscal controls, but rather should focus on strengthening the institutions and efficiency of tax administration.

In conclusion, how do we fight tax evasion in a sustainable way?

The results of the economic experiments suggest that the Government, instead of increasing the tax penalties or the number of fiscal controls, should focus on promoting positive social information about fiscal compliance in parallel with encouraging the whistleblowing practices (when citizens report to tax authorities about any observed and/or suspected tax evasion in the community or country). In particular, it is necessary to start a well-targeted information campaign that will inform the population about the progress on fiscal compliance at community and country level. In parallel, the probability of detecting tax evasion must increase endogenously, by encouraging voluntary reporting by whistleblowing to tax authorities, and not exogenously (by increasing the number of controls by the tax authority). According to economic experiments, this combination between promoting positive social information and increasing the number of fiscal controls as a result of citizens' reporting (whistleblowing mechanism) is the most effective solution to induce fiscal compliance behavior in the long-run and in the most sustainable way.

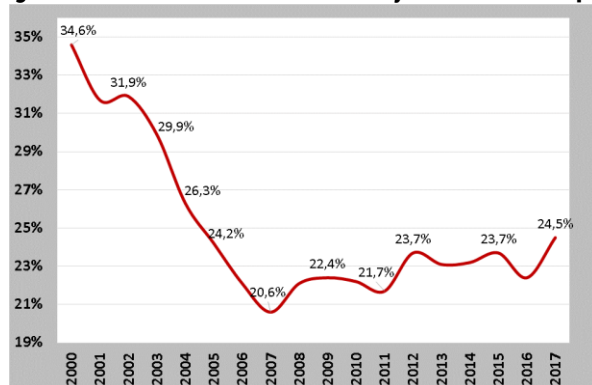
Problem Definition: Tax Evasion in Moldova

The shadow economy in Moldova has reached the point where it has a very strong and persistent negative impact on the tax revenues, but especially on the economic growth. The large size of the shadow economy is mainly due to weak institutions, characterized by limited administrative abilities in the public sector to coordinate and manage the economic system and the relationships that characterize it. It placed Moldova among the countries with the highest level of shadow economy in the region. Under these conditions, proper understanding of this phenomenon and how to deal with it becomes even more relevant. Thus, by examining the multilateral economic and non-economic factors that determine such a behavior, will facilitate the formulation of more effective policies in this regard.

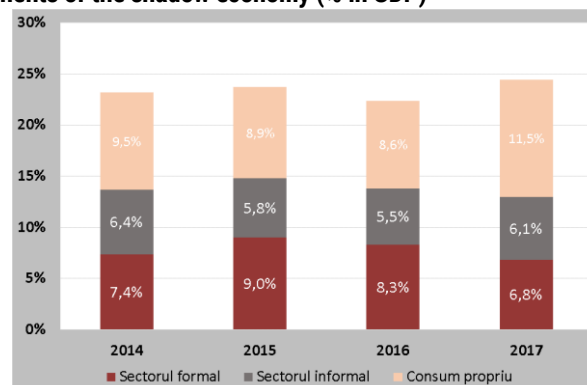
What is the origin of tax evasion in Moldova?

In recent years, the shadow economy in Moldova has been steadily growing and spreading, affecting increasingly the development of the economy. Thus, the lack of transparency and institutional weaknesses have led to increased tax evasion from year to year. Also, the phenomenon of corruption has contributed to the intensification of this process, and one of the underlying causes may be the cultural traits of the society around it. According to official data, the share of the shadow economy has increased from 20.6% in 2007 to 24.5% in GDP in 2017 (Figure 1). It is worth mentioning that the shadow economy comprises the informal sector, the hidden production in the formal sector, the illegal production, but also the production of the households. Of these, a considerable contribution to the growth of unobserved processes was brought by the hidden sector (referring to tax evasion), that comprises all legal production activities, which are intentionally underestimated or hidden by the economic agents, not registered by the relevant public authorities. In other words, tax evasion, i.e. non-payment of taxes, contributions to state social insurance funds, compulsory medical insurance, ranges around 7-9% of GDP, according to the most conservative estimations (Figure 1).

Figure 1. Share of the shadow economy in GDP and components of the shadow economy (% in GDP)



Source: NBS



Source: NBS

The immediate effects of tax evasion are related to forgone losses to the state budget (fiscal discrepancy). In the last years, the total fiscal discrepancy¹ (difference between de facto and potential revenues) is estimated at about 7% of GDP. Thus, due to the existence of a large unobserved economy, the annual public budget does not collect revenues in the amount of at least 9-10 billion MDL. The amount of potential tax revenues, however, is higher, because the losses from illegal production in the national economy were not taken into account. Still, the hidden production in the formal

¹ Estimation based on the methodology of A. Cobham 'Tax evasion, tax avoidance, and development finance', Queen Elisabeth House Working Paper, No 129, 2005.

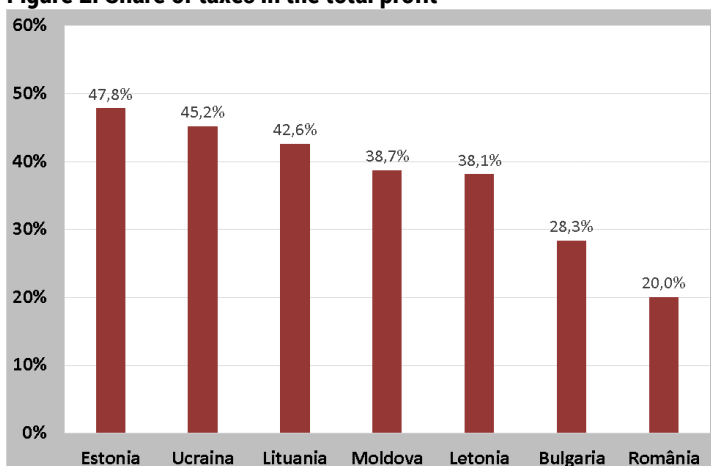
sector (i.e. tax evasion) as a share of total revenue missed to the budget started to increase since 2009. By 2009, only about 20% of total revenue missed to the budget could be attributed to tax evasion, which increased to 37-38% or about 3,5 billion MDL nowadays².

In order to understand the phenomenon of tax evasion, it is important to set out the main causes that can lead to this type of behaviour in Moldova:

a) Perceptions about high fiscal pressure

When the average tax pressure is relatively high, the taxpayer can choose to evade this taxation, either in full (entering the shadow economy) or in part, practicing tax evasion although its activity remains in the official economy. It is quite difficult to establish a certain quantitative threshold at which the taxpayer decides to avoid taxes. This threshold depends on both the sector of activity and psychological or cultural aspects, which are difficult to quantify. It should be mentioned that, in Moldova, the fiscal pressure is perceived as high. However, compared to other countries of reference, the fiscal pressure appears to be moderate: according to the "Doing Business 2020" ranking, the share of total taxes in the profit is about 38.7%, while, in Romania, this constitutes only 20.0% and in Ukraine – 45.2% (Figure 2). The negative perception in Moldova regarding the fiscal pressure could be explained, on the one hand, by the precarious and unstable financial conditions of many economic agents, and, on the other hand, by the lack of confidence in public institutions and the negative perception regarding the returns on tax payments (e.g. poor quality of public goods and services). These are also the determining factors, which fuel the motivations of the economic agents to avoid paying taxes and to resort to informal ways.

Figure 2. Share of taxes in the total profit



Source: *Doing Business 2020*

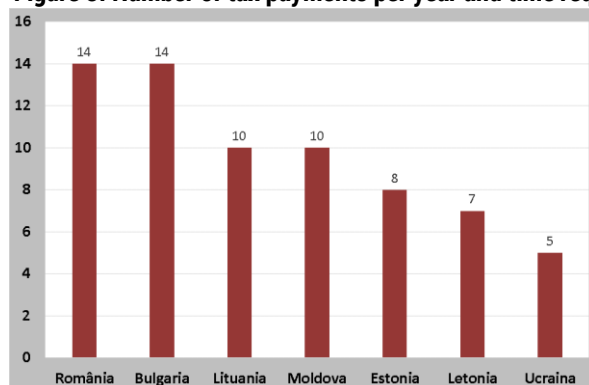
b) Complexity and instability of fiscal regulations

The complexity and, in particular, the instability of fiscal regulations complicates the accounting and cause errors when the economic agents calculate their taxes and fees. According to the ranking "Doing Business 2020", Moldovan companies must comply with a total of 10 payments during a year, which is a moderate figure in comparison with other reference countries (Figure 3). On the other side, the time required to make tax payments is quite high in the regional profile - 183 hours/year, which reveals the issues related to the tax

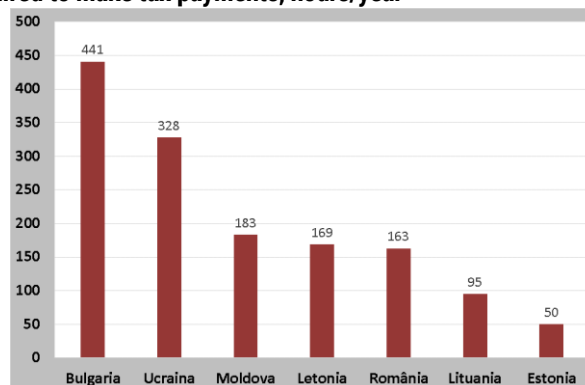
² Iurie Morcotilo (2018). Analytical Commentary "Non-Observed Economy and Corruption: Links and Consequences".

management and exposes the firms to risks of corruption. In general, it is considered that for business community the tax managing seems to be much more deficient, compared to the fiscal burden. Thus, while businesses are forced to make more tax payments, ambiguous tax regulations expose entrepreneurs to the risk of corruption. Therefore, this explains the high costs of formal activities, representing a powerful additional incentive for economic agents to resort to informal activity.

Figure 3. Number of tax payments per year and time required to make tax payments, hours/year



Source: Doing Business 2020



Source: Doing Business 2020

c) Weakness of the tax administration

The taxpayer can resort to tax evasion if sanctions are low or the probability of being identified and sanctioned is low. This behaviour can occur irrespective of the tax rate (irrespective of the tax pressure in general), as tax evasion can therefore occur even if the tax pressure decreases. The weakness of the tax administration can be the effect, on the one hand, of corruption and, on the other, of logistical or professional incapacity (incompetence).

d) Moral hazard (fiscal facilities)

Moral hazard occurs in the situation of the existence or promise of fiscal facilities. Fiscal facilities have the effect of reducing the tax burden, either through exemptions or cancellations of budgetary debts, or by granting other forms of fiscal support. Taxpayers who receive such facilities continue to behave in the hope of receiving new facilities, thus generating a behaviour designed to avoid the tax burden and make tax evasion. This is the case of tax amnesty in 2007 and capital amnesty in 2018.

e) Contagion (imitation)

Contagion occurs when some individuals observe the behaviour of other individuals and try to replicate for financial gains. Thus, if some companies/individuals practice tax evasion without being properly sanctioned, other companies/individuals will tend also to make tax evasion. In this way, tax evasion generates even more tax evasion. The force of contagion in generating or extending the evasion phenomenon is particularly consistent, depending, in particular, on cultural and institutional factors.

The five fundamental causes generating tax evasion in Moldova are directly proportional to the extent of tax evasion: the more they grow, the more tax evasion increases. At the same time, among these causes there are certain relationships: a) the weaker the tax administration - the higher the contagion, b) increased fiscal pressure may lead to the need for new tax facilities, which increases the moral hazard, c) increased weakness of the tax administration can lead to increased fiscal pressure, in order to counteract the decrease in budget revenue.

Economic Experiments: Methodological Details

In any country, tax compliance is the result of both voluntary compliance and enforcement. It would be simplistic to think that taxpayers comply with tax laws just because they think it is the right thing to do. An element of coercion is present in most cases. A recent surge in empirical studies has contributed to shed light on the behavioural factors in determining tax compliance and on what tax administrators can do to improve it. This recent surge has seen the emergence of laboratory experiments as a useful method of causal inference. In effect, economic experiments conducted under the controlled conditions of the laboratory have been largely used in the past 15 years to isolate the effect of tax morale (i.e., the voluntary compliance with tax laws) from other factors, such as changes in the objective or subjective probability of detection, the introduction of policies that alter the severity of punishment, changes in tax rates, in households' income or any other event that may affect the monetary costs and benefits of tax compliance. The major difference between economic experiments and surveys is that with surveys it is difficult to get honest answers about dishonest behaviour (for this reason, surveys focus on attitudes rather than behaviour). Tax evasion experiments address this drawback by looking at real taxpayer behavior rather than perceptions. The below described tax evasion experiments aim at comparing tax morale in Moldova and in France and compare the effects of different behavioral mechanisms (whistleblowing, social information, changing the probability of detection versus the severity of punishment) on tax compliance rates in both countries. The experiments consist of five experimental treatments. Each experimental treatment implements a specific environment (a set of parameters) within which participants must make a series of decisions. Each individual in the experiments conducted for this project participated in only one experimental treatment.

The baseline tax evasion game

The participants in the control (baseline) treatment played 15 rounds of the taxation game. In each round, participants received a real income from the experimenter. The income that each participant received varied in each round, ranging from 20 to 100 Experimental Currency Units (ECU) and was randomly drawn by the computer from a uniform distribution. In each round, participants were asked to declare their total income to the central authority in the experiment and pay a 40% tax on their declared income. The tax rate was the same for all declared incomes and for each participant. The choice of the tax rate was motivated by the main goal of this study, which is to identify the strength of tax morale in Moldova as compared to a western country, France, under different sanctioning mechanisms. A lower tax rate would have added noise to the interpretation of the results since it would have been difficult to say whether observed compliance is due to tax morale – the moral obligation to pay taxes – or is the result of low incentives to engage in tax evasion because of low taxes. Previous experimental studies have shown that with a 40% tax rate, tax evasion is present, although an important fraction of individuals voluntarily choose to not engage in under-reporting (Masclet et al., 20193).

The decisions to engage in tax evasion is taken in a dyadic set-up where a citizen interacts with the public authority. To mimic governmental authorities in the laboratory, we made clear to the participants that they had to declare their incomes to the central authority in this experiment. Although participants had no further information about the identity of the authority, previous experimental studies suggest that in this type of environments participants defer to the experimenter as the authoritative figure in the experiment. Because the legitimacy of the central authority has shown

³ Masclet, D., Montmarquette, C. & Viennot-Briot, N. (2019). Can whistleblower programs reduce tax evasion? Experimental evidence. *Journal of Behavioral and Experimental Economics*, 83, 1-15.

to play an important role in experimental games studying prosocial behavior (Baldassari and Grossman, 2011⁴), we wished to minimize the possibility that the central authority in our experiment is seen as illegitimate. The reasons for this choice are twofold. First, the legitimacy/illegitimacy of central authorities is not the topic of this study. Thus, we wanted to keep this parameter (i.e. the legitimacy of central authorities) constant in all our treatments. Second, because this is a cross-cultural experiment (in Moldova and in France) we needed to ensure that participants in both countries had a similar representation of the authority in the experiment. Thus, while some recent experimental studies used a randomly selected participant to act as the authority, we elected to use the experimenter as the only central authority as the experimenter is most likely to be seen as a legitimate authority (Milgram, 1963⁵; Karakostas and Zizzo, 2015⁶).

The participants were informed that they are the only ones who have full information about the income received. That is, the central authority (i.e., the experimenter) has no information about individual incomes. However, the central authority in the experiment can audit the incomes to verify whether participants declared total income. In the control treatment, the probability of being audited for each participant was 20%. Thus, each participant in each round had a 20% probability of having his/her income declaration audited. Empirical studies have shown that the probability of audit for self-reported income is very low (studies in the USA found that it is lower than 5%), which explains the high evasion rates for this type of revenues (Andreoni et al., 19987; Kleven et al., 20118). Indeed, tax enforcement authorities have limited resources and can only audit a small number of individual declarations. What is more, in developing countries, it is important to keep in mind that there may be a gap between the de jure auditing probability (i.e., the official numbers) and the de facto probability of being monitored and punished for deviant behavior (i.e., the actual probability that someone who under-reported is sanctioned). The existence of corrupted law enforcement agents may be one reason for this tax enforcement gap. In the context of this experiment, it was important to implement a tax rate in the baseline scenario that was not too low in order to be able to decrease this probability even further and identify the causal impact of varying the auditing probability on tax evasion rates. Indeed, in the other treatments presented below, the probability of detection is either endogenously modified (participants can increase this probability by reporting others to the central authority) or it is exogenously modified (the experimenter announces a higher/lower auditing probability, depending on the experimental treatment).

In the baseline experiment, if unreported income is detected, the participant is charged 1.5 times the standard tax rate on the income evaded in the round that is audited. That is, in case tax evasion is detected, the participant pays the due taxes and a penalty that is 50% of what the participant would have paid if s/he had fully complied. The penalty has been chosen so as to make it non-deterrent, that is a penalty that should not change the participants' dominant strategy. In other words, if participants in this experiment resent no moral obligation to pay taxes, then they should declare zero income in each round in order to maximize their monetary gains (previous empirical estimates suggest that self-interested individuals should not declare self-earned income, see Andreoni et al., 1998). The severity of punishment coupled with the auditing probability does not offer strong enough incentives for the participants to declare an income different than zero (under the assumption that the participants resent no moral obligation to pay taxes). In our simple baseline game, there is only one factor that can explain why participants would declare total income. That is the participant's sense of duty or what is called in the economics literature tax morale. If the participant

⁴ Baldassari, D. & Grossman, G. (2011). Centralized punishment and legitimate authority promote cooperation in humans. *PNAS*, 108(27), 11023-11027.

⁵ Milgram, S. (1963). Behavioral study of obedience. *The Journal of Abnormal and Social Psychology*, 67(4), 371-378.

⁶ Karakostas, A. & Zizzo, D-J. (2016). Compliance and the power of authority. *Journal of Economic Behavior and Organization*, 124, 67-80.

⁷ Andreoni, J., Erard, B. & Feinstein, J. (1998). Tax compliance. *Journal of Economic Literature*, XXXVI, 818-860.

⁸ Kleven, H-J., Knudsen, M-B., Kreiner, C-T., Pedersen, S. & Saez, E. (2011). Unwilling or unable to cheat? Evidence from a tax audit experiment in Denmark. *Econometrica*, 79(3), 651-692.

resents a moral cost associated with the act of under-reporting, then s/he may fully comply even when the expected material penalty is low. It should be clear that with strong enough material incentives to comply with taxes, it would be impossible to say whether compliance is the result of the material penalty or of tax morale. This is why we chose to implement a combination of penalty severity and auditing probability that makes the expected material cost of tax evasion mild enough. Thus, in the experimental game, tax compliance is the sole result of tax morale rather than material incentives. Yet, it is important to note that research in behavioral economics has provided empirical evidence showing that people systematically and substantially misperceive objective probabilities (Kahneman and Tversky, 1979). Thus, individuals react to penalties even when the probability of being detected is close to zero. In additional experimental treatments, we isolate the effect of changing the auditing probability on tax evasion rates. First, we present an experimental treatment where participants can affect the auditing probability by reporting tax evaders to the central authority. Then, we present experimental treatments where the auditing probability and the punishment severity are exogenously manipulated by the experimenter (think of tax authorities that decide to increase/decrease the probability of detection and the punishment meted out in case of detected misreporting of income).

Signals from below: whistleblowing and social information

The first mechanism that we investigate is the introduction of whistleblowing – the voluntary reporting of tax evasion to the central authority. In the whistleblowing treatment, two new steps are added compared to the control (baseline) condition. First, after each round, each participant is informed about the percentage of income declared by three other participants in the room (who play the same taxation game). More specifically, each participant observes the income declarations of the same three other participants after each of the 15 rounds of the game. This is similar to a group of neighbours who have some information about the income declaration of each other. The second additional step compared to the control treatment is that after having observed the declared income rates of the others, each participant can anonymously report any observed tax evasion to the central authority. In this treatment, peer-reporting of tax evasion (i.e., whistleblowing) is costly: each report costs the participant who reports 2 ECU. Peer reporting is indeed costly, as it is the case in real-life where one needs to collect relevant information in order to blow the whistle on someone who engages in tax evasion.

Tax evaders who are reported to the central authority are automatically audited and subject to the same penalty as in the control treatment. Thus, in this treatment, the auditing probability may be endogenously affected by the participants themselves. Peer reporting is used as a tool to reduce tax evasion in numerous countries. Examples include the US Internal Revenue Service's whistle-blower program launched in 2006, the Evasori program active in Italy and a similar initiative implemented in Greece in the aftermath of the 2008 financial crisis. The idea underlying these programs is that citizens are better informed than tax authorities about cases of tax evasion and are willing to share this information with the tax enforcement agency.

Since whistleblowing implies social observation, it is important to disentangle the effect of peer reporting from the effect of merely observing the income declarations of others. This is why another treatment was implemented without whistleblowing, but with social observation – henceforth called the social observation treatment. Indeed, public authorities in many western countries have used social information as a tool to change taxpayers' behavior. In a recent experimental study conducted in the UK, Hallsworth et al.¹⁰ (2017) randomized five messages across 100,000 individual taxpayers: three social-information messages and two public goods messages. The former are: (i) "Nine out

⁹ Kahneman, D. & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263-292.

¹⁰ Hallsworth, M., List, J., Metcalfe, R. & Vlaev, I. (2017). The behavioralist as tax collector: Using natural field experiments to increase tax compliance. *Journal of Public Economics*, 148, 14-31.

of ten people pay their tax on time”, (ii) “Nine out of ten people in the UK pay their tax on time”, (iii) “Nine out of ten people in the UK pay their tax on time, you are currently in the very small minority of people who have not paid us yet”. The experimental results showed that the social-information messages had a large and positive impact on tax compliance. The most efficient message was the one emphasizing the norm and indicating that the individual is in the minority. Our social observation treatment is similar in that participants can compare their declaration rates to the declaration rates of three other participants. However, in our case, the social information that participants obtained was not always positive. In fact, participants always observed tax evasion to some extent. That is, contrary to the study by Hallsworth and co-authors, we did not control the content of the information provided to our participants. Participants observed both compliance and tax evasion, depending on the decisions of randomly selected three other participants who were members of one’s group.

A test of the deterrent effect of changing the detection probability versus the penalty severity

As mentioned above, the probability of detection can be affected by the citizens if they report tax evaders to the central authorities. Alternatively, the probability of detection can be increased or decreased by the central authorities if additional resources are allocated to uncover cases of income misreporting. However, economic theory suggests that an alternative to increasing the probability of detection (which is costly to the central authorities) is to render the penalty more severe leaving the probability of being caught unchanged – thus saving scarce resources. An extreme example is when the penalty is as high as possible, while the probability of detection is close to zero. In this case, tax compliance should be full if individuals are rational (that is, if they rationally evaluate expected costs and benefits).

In addition to investigating the effect of whistleblowing, another objective of this policy study is to test which policy alternative works best to decrease tax evasion: increasing the level of the penalty or increasing the probability of detection. The experimental results will shed light on some alternative policies that might be considered by tax enforcement authorities, namely the increase in the probability of detection as compared to an increase in the severity of punishment.

To compare these alternative policy mechanisms (increase in the probability of detection vs increase in the severity of punishment), two additional treatments have been designed. The first treatment – referred to as the detection treatment – increases the probability of detection as compared with the control (baseline) condition, holding the expected cost from tax evasion constant. That is, the probability of detection is increased from 20% to 40%. At the same time, the new penalty for tax evasion is reduced from 50% to 25% of the due taxes on unreported income. The increase in the auditing probability is followed by a decrease in the penalty severity because we want to isolate the sole impact of manipulating the auditing probability. In effect, there is empirical research showing that increasing both the probability of detection and the severity of punishment – which simply means that the expected cost of engaging in the targeted behavior has increased – may be regarded by citizens as unfair and may lead to an increase in the undesired behavior rather than a decrease (Gneezy and Rustichini, 2000). Tax authorities may want to change the two parameters (probability of detection and penalty severity) in such a way as to reduce tax evasion but without giving citizens the impression that it implements more coercive policies.

Finally, in a different treatment – referred to as the sanction treatment – there is an increase in the punishment severity, from 50% to 100% of unreported income. However, the probability of detection is reduced from 20% to 10%. With this treatment, we test the standard economic prediction that it is possible to save resources on auditing by significantly increasing the severity of punishment in case of detection.

The implementation of the experimental tax evasion games in Moldova and in France

The experiments have been conducted in France and in Moldova between April and September 2019. The experimental sessions in France have been conducted at the Laboratory for Experimental Economics in Montpellier (LEEM). In total, 189 subjects participated in the experiments conducted at the LEEM. The participants were male and female students at the University of Montpellier. 51% were female and 49% were male. Students at the University of Montpellier regularly participate in experimental studies conducted by researchers from the LEEM. Each subject was seated at a terminal and had to make decisions on computer. Terminals were separated by lateral partitions to ensure complete anonymity. Payments were made privately in order to ensure that participants' decisions were made anonymously.

The experimental sessions in Moldova have been conducted at the Academy of Economic Sciences (ASEM). We ensured that the participants face similar conditions in the experiments conducted in Moldova compared to the experiments implemented in France. Thus, the participants were seated at terminals which were separated by lateral partitions. Payments were also made privately. However, the major difference between the French subject pool and the participants to the experiments in Moldova is that the latter participated in an experiment for the very first time. Therefore, they had no previous experience with a laboratory experiments, which could result in more obedience to the rules of the game than in France. The number of participants in the experiments in Moldova (344) is larger than in France (189). 55% of participants in Moldova were female. Finally, it is worth noting the conversion rate from Experimental Currency Units to Euros and Lei. In France, 10 ECU = 3 Euros, whereas in Moldova 10 ECU = 40 Lei. The experimental design is summarized in Table 1 below.

Table 1. Summary of the experimental design

<i>Participant pool</i>	<i>Number of subjects</i>	<i>Number of sessions</i>	<i>Treatment</i>
France	32	2	Control Condition
France	36	2	Whistleblowing
France	36	2	Social Observation
France	33	2	Detection
France	52	2	Sanction
Moldova	48	2	Control Condition
Moldova	64	2	Whistleblowing
Moldova	92	2	Social Observation
Moldova	68	2	Detection
Moldova	72	2	Sanction

Findings

The findings from tax evasion games conducted in Moldova and in France are fourfold. First, the data show that tax morale is higher in Moldova than in France when there is no social information and no whistleblowing in place. Indeed, tax compliance rates are higher in the “Baseline” treatment conducted in Moldova compared to the same treatment implemented in France. However, one should note that the behavioral differences between the two countries in this treatment may also be due to the Moldovan participants’ tendency to want to please the experimenter or, in other words, to be compliant given that the experimenter played the role of the central authority in the experiment. It is difficult to disentangle the two effects. Nonetheless, this result provides a valuable policy insight: when the authority is perceived as legitimate, compliance rates among the participants in Moldova are quasi-optimal, which is not the case in France. The second result is that there are positive and negative spillover effects from social information, meaning that one’s declaration rate is positively correlated with the declaration rates of the other participants whom one observes in the experiment and observing some tax evasion has strong negative effects on tax compliance (the bad example seems to be stronger than the good example). The third bold result is that whistleblowing reduces tax evasion rates both in Moldova and in France compared to a scenario where individuals merely observe each other’s decision. Finally, the fourth main result is that an extremely low probability of detection (coupled with a high penalty) and a very high probability (coupled with a low penalty) lead to more tax evasion than a ‘reasonable’ probability of detection coupled with a moderate penalty.

The level of tax morale in Moldova relative to France

The first question addressed in this policy brief is whether tax morale is lower in Moldova compared to France. As shown in the empirical literature in economics, tax morale and institutional quality are the two major elements that affect the shadow economy (Torgler and Schneider, 2009¹¹). Given that the shadow economy occupies a more central place in the Moldovan economy than in the French one, the initial prediction is that tax morale is lower in the former country compared to the latter. In this experiment, we are able to measure the extent to which participants in both countries resent the moral obligation to report income, controlling for any coercive factors. As presented above, tax compliant behavior in the control condition is the result of tax morale because the sanction is not deterrent. Figure 4 and Figure 5 presents the evolution in the percentage of income declared over the 15 rounds of the game. The solid brown line corresponding to “Baseline” presents the rates of tax compliance in our control condition. Figure 4 reports the evolution in tax compliance in France, whereas the results from the experiments in Moldova are displayed in Figure 5. From a mere visual inspection of Figure 4 and Figure 5, it is clear that tax compliance is substantially higher in Moldova than in France when we consider the “Baseline”. That is, with no information about the declaration rates of others and with no whistleblowing, on average, participants in Moldova have higher rates of tax compliance than participants in France in the same treatment. This result is consistent over the 15 rounds of the tax evasion game and are confirmed by non-parametric statistical analyses (these tests are appropriate with small samples). In effect, the Mann-Whitney rank sum comparison between the “Baseline” treatments in Moldova and in France yields a p-value of 0.000, rejecting the hypothesis that the two independent samples were selected from populations having the same distribution. In other words, the average tax compliance rates in Moldova under the Baseline treatment are higher than the average tax compliance rates in France under the same treatment. It is important to note that the unit of analysis in non-parametric analyses is the group of 4 individuals. Therefore, we cannot address the effect of other factors (such as gender or age) with this type of analysis.

¹¹ Torgler, B. & Schneider, F. (2009). The impact of tax morale and institutional quality on the shadow economy. *Journal of Economic Psychology*, 30(2), 228-245.

Figure 4. Evolution in tax compliance rates (% of income declared) over the 15 rounds of the tax evasion game in France

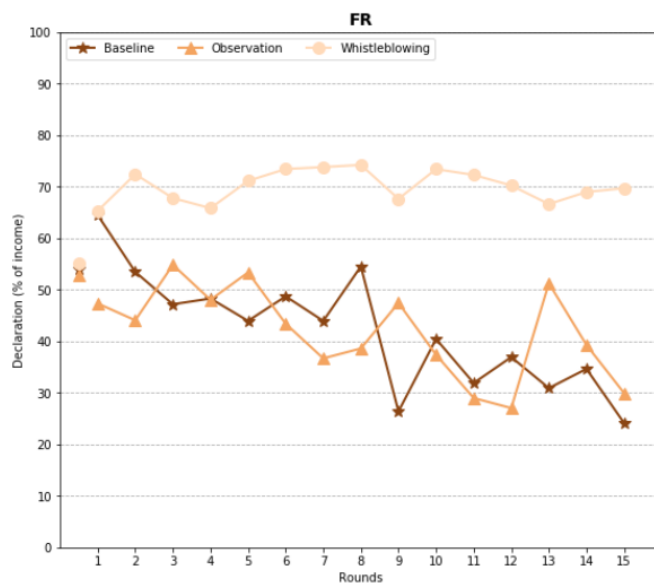
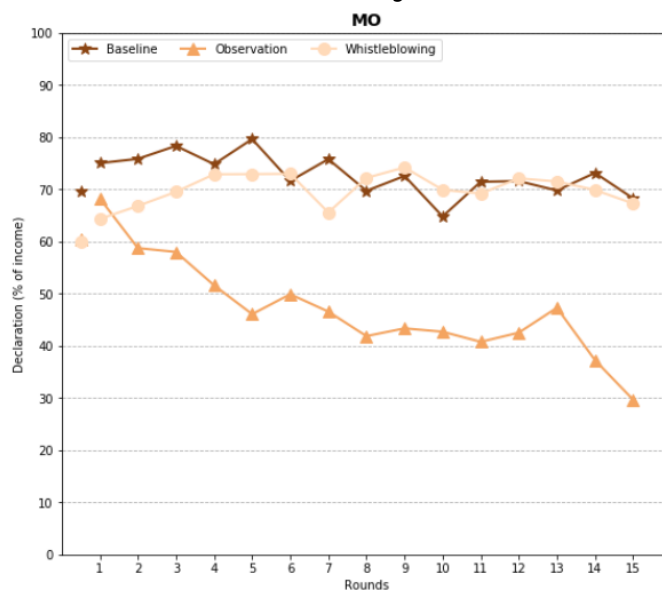


Figure 5. Evolution in tax compliance rates (% of income declared) over the 15 rounds of the tax evasion game in Moldova



The impact of disseminating social information about tax evasion and tax conformity

The experiments tested how participants react when social information about the declaration rates of others is added. By inspecting the tax compliance rates in the “Social observation” treatment reported in Figure 4 and Figure 5, it is clear that the dissemination of social information about the declaration rates of others in the community has no impact

whatsoever on the behavior of participants in France, while it negatively affects tax compliance rates in Moldova. In other words, in Moldova, participants avoid paying income taxes to a larger extent when informed about the behavior of others compared to when this information is absent. This result implies that for Moldovan participants the mere fact of observing tax evasion (to some extent) in their community makes them switch from tax compliance to tax evasion to a larger extent than the participants in France. These results are confirmed by the non-parametric Mann-Whitney ranksum test. When comparing the “Baseline” to the “Social observation” treatment in France, the p-value is equal to 0.235, indicating that the difference between the two is not statistically significant. However, the p-value for the same comparison in Moldova is equal to 0.000, indicating that the difference in average tax compliance rates is highly significant. Tax compliance is higher in the “Baseline” than in the “Social observation” treatment in Moldova.

The question that these results raise is whether spillover effects from social information are determined by the specific behavior of the others. In other words, the results that we observe by comparing “Baseline” to “Social observation” may be due to the observation of positive or negative behavior (tax compliance versus tax evasion). To disentangle the two potential effects, we use a Tobit model where the dependent variable is the rate of income declaration (at the individual level) and we include a number of covariates, such as gross income, whether the individual has been audited in the previous round, the average group declaration in the previous round (which will indicate whether individuals react positively or negatively to a given amount declared by the others in one’s group), and the participant’s gender.

Table 2. Random effects Tobit model. The dependent variable is the rate of income declaration. The control treatment is “Baseline”. The data are exclusively from the experimental sessions conducted in Moldova

	Estimates	Standard error	p-value
Gross income	-0.618	0.048	< 0.001
Audited in t-1	-16.308	1.927	< 0.001
Social observation treatment	-32.276	6.432	< 0.001
Average group declaration rate in t-1	2.420	0.087	< 0.001
Gender (male)	-14.320	5.638	< 0.01
Number of groups	35		

The results from Table 2 clearly indicate that the declaration rate of a given individual is positively correlated with the declaration rates of the others in the group (the positive coefficient on “average group declaration rate in t-1”). Hence, there are positive spillover effects. The fact that compliance rates are lower in “Social observation” compared to the “Baseline” indicate that overall in each round individuals observe some tax evasion and are highly (and negatively) influenced by the dishonesty of the others they get to observe. Another interesting result to be noted from Table 2 is the negative effect of gross income: richer individuals declare lower shares of their income. Another result is that being sanctioned in round t makes participants declare lower shares of income in t+1. The way to interpret this result is that a participant who is audited and sanctioned in round t expects that it is less likely that s/he will be audited in t+1. Therefore, his/her declaration rate is lower. It also appears that male participants’ rates of declaration are lower than female participants’ declaration rate. This result is not treatment dependent. In every treatment, men appear to comply at lower rates than females. Previous laboratory experiments have shown that men tend to behave less prosocially (Espinosa and Kovanik, 2015¹²). However, given the small sample in our experiments, the results from the individual level analyses are to be interpreted with some degree of cautiousness.

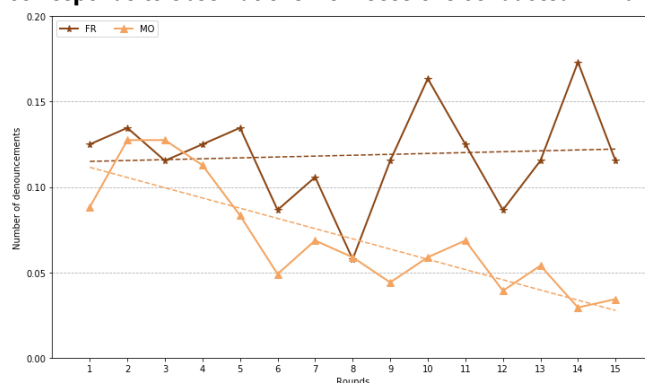
¹² Espinosa, M-P. & Kovanik, J. (2015). Prosocial behavior and gender. *Frontiers in Behavioral Neuroscience*, 9(88).

The impact of whistleblowing on tax compliance

The effect of whistleblowing in the two countries seems to be similar: the Mann-Whitney ranksum test yields a p-value of 0.488, indicating that the average tax compliance rates in the two countries under whistleblowing are similar. However, it is important to note that the effect of whistleblowing is to be compared with the “Social observation” treatment. Indeed, whistleblowing can only function in a society where citizens have social information about the declaration rates of others (that is, to be able to report on others, one needs to have some information about the behavior of the other members in the community). The question is then whether social observation alone yields similar tax compliance rates compared to social observation plus whistleblowing. When we compare the two, the data from our experiments indicate that whistleblowing has a positive and significant effect on tax compliance in Moldova and in France. These results are confirmed by statistical analyses. In Moldova, the difference between the “Whistleblowing” treatment, on the one hand, and “Social observation”, on the other hand, is statistically significant with a p-value equal to 0.000 (Mann-Whitney ranksum test). The difference between these two treatments is also significant in France (p-value equal to 0.010). Hence, if citizens have access to social information about tax evasion in the community, public authorities can significantly increase tax compliance by introducing a whistleblower program.

To further explore the differences in how whistleblowing works in the two countries, it is useful to look at the number of denunciations. Whistleblowing is costly, it requires an individual to spend valuable time and resources on collecting information about someone else and collaborating with the public authorities. These resources could be spent in alternative and more productive ways. Interestingly, we observe that while the number of denunciations is similar in the two countries in the first rounds of the experiment, in Moldova, there are less denunciations over time reaching virtually zero in the final round, which is not the case in France where this number increases with the repetition of the game. This means that the social cost from whistleblowing is higher in France than it is in Moldova. It appears that the mere threat of whistleblowing in Moldova has a strong deterrent effect. Whistleblowing is also costly for the public authorities since there are administrative costs associated with setting up and running a whistleblower program. The experiment suggests that these costs would be lower in Moldova (than in our comparison group, France) because people rarely use whistleblowing over time.

Figure 6. The average number of denunciations on the vertical axis. The number of rounds on the horizontal axis. The orange line corresponds to observations from Moldova and the brown line corresponds to observations from sessions conducted in France.



Higher penalties or higher probability of detection: what is more efficient in fighting tax evasion?

The results from whistleblowing may be interpreted as indicating that increasing the probability of detection could be an efficient way to reduce tax evasion. However, our second set of experiments shows that when the auditing probability is changed exogenously (i.e., by the experimenter) tax evasion rates are higher than when the same variable is affected by the individuals themselves, as in the “Whistleblowing” treatment (although the difference is not statistically significant). Figure 7 and Figure 8 below shows the evolution in the declaration rates in the control condition “Baseline” where the probability of detection is 20% (and the sanction is 50% of due taxes), in the “Detection” treatment where the probability of detection is increased to 40% (but the sanction is 25% of due taxes), and in the “Sanction” treatment where the probability of detection is 10% (while the sanction is set to 100% of due taxes).

Figure 7. Evolution in tax compliance rates (% of income declared) over the 15 rounds of the tax evasion game in Moldova. Data are from treatments “Baseline”, “Detection”, and “Sanction”

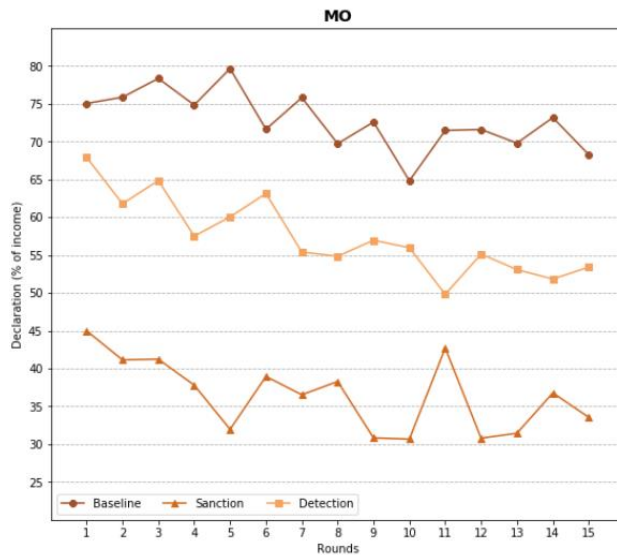
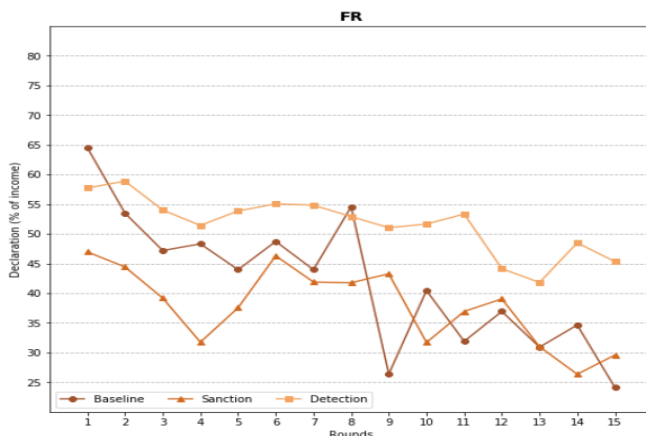


Figure 8. Evolution in tax compliance rates (% of income declared) over the 15 rounds of the tax evasion game in France. Data are from treatments “Baseline”, “Detection”, and “Sanction”



From Figure 8, it is clear that there are only small differences in tax compliance rates between the three treatments in France. The difference in average declaration rate between the treatment “Baseline” and the treatment “Detection” is significant at 10%. That is, the average declaration rates are higher in the “Detection” treatment than in the “Baseline”. However, the effect is small. In Moldova, the non-parametric test indicates that the difference between our control condition, “Baseline”, and the other two treatments is statistically significant and goes in a different direction than the difference observed in France. In fact, tax compliance is always higher in the “Baseline” than in the other two treatments. As we have shown above, the declaration rates in the “Baseline” are relatively high and the two other treatments do not achieve the same results. The results from the “Baseline” treatment imply that there needs to be a reasonable chance that a tax evader is detected (a 1 in 5 chance is sufficient to remind individuals that tax evasion does not go unpunished) and the punishment level in case of detection needs to be set in such a way as to not be viewed as unfair (which may have been the case in our “Sanction” treatment where punishment is 100% of due taxes and where we observe the lowest rates of declaration – it is however difficult to say whether the penalty was considered unfair or tax declarations are low because of the low detection probability).

Table 3. Non-parametric (Mann-Whitney ranksum test) comparisons between treatments in each country

	Treatment		Treatment	p-value
France	Baseline	versus	Sanction	0.255
France	Baseline	versus	Detection	0.059
France	Detection	versus	Sanction	0.057
Moldova	Baseline	versus	Sanction	0.000
Moldova	Baseline	versus	Detection	0.006
Moldova	Detection	versus	Sanction	0.000

Key conclusions and recommendations

We used economic games in controlled laboratory conditions to isolate the effect of several factors on tax compliance: (i) tax morale, (ii) whistleblowing, (iii) the probability of auditing, and (iv) the severity of the penalty in case of detected tax evasion. The first bold result from the experiments conducted in Moldova and in France is that **tax morale appears to be higher in Moldova**. This result is surprising given that the size of the shadow economy is larger in Moldova than in France. However, it is important to keep in mind that the shadow economy is affected by tax morale, but also by the quality of institutions. In these experiments, we controlled for the quality of institutions. The experimenter played the role of the central authority. As stated above, the experimenter is generally viewed as a legitimate authority in this type of experiments. Therefore, if we were to change the quality of institutions, the results may be completely different. Hence, it is important to keep in mind that we find that tax morale is relatively high in Moldova for a given quality of institutions.

The results from the economic experiments on tax evasion conducted in Moldova and in France shed light on the policies that could reduce dishonest behaviors within the population. First, the findings regarding the level of tax morale in Moldova suggest that under the right set of institutions, people in Moldova are willing to comply with tax laws at quasi-optimal levels. Ideally, and in the long run, the focus of public authorities should be on improving the quality of formal institutions – e.g., increased transparency on the allocation of public resources, a collective-decision process that accounts for citizens' preferences, and reduced corruption among public officials. However, in the short-run, public authorities could also better communicate about the bold public projects financed by public taxes. The public provision of relevant information regarding public goods can alter people's preferences and beliefs about the moral reprehensibility of tax evasion.

In addition to tax morale and the institutional quality, the results from these economic experiments demonstrate the importance of social information. The data clearly show that individuals' tax compliance decisions are correlated with the decisions of the other group members. An important finding is that participants from Moldova are particularly sensitive to negative social information. Indeed, the observation of some tax evasion significantly reduces tax compliance rates.

Individuals tend to copy good and bad behavior, meaning that there is a strong correlation between the declaration rate of an individual and the average declaration rate of the others in the individual's group. More important, bad behavior is more contagious than is good behavior: it is enough that a group observes some tax evasion (even at low levels) to induce the group members to actively engage in dishonest behavior (leading to a cascade of dishonest behavior). There are many real-life situations where individuals exchange various types of information, including information about instances where someone in the individual's network engaged in some form of antisocial behavior (tax evasion, bribing a public official). We rarely witness situations where one would proudly describe how s/he fully complied with tax laws (or any other form of formal rule). Public authorities need to implement policies targeted at updating citizens' beliefs regarding the prevalence of tax evasion in one's community. For example, social information messages similar to the ones used by Hallsworth et al. (2017) can be a cost-effective way to influence beliefs and behaviors¹³.

When citizens can observe each other's good and bad social behavior, whistleblowing may help to reduce the frequency of dishonest behavior. Indeed, social information messages can be complemented with a whistleblower

¹³ Hallsworth et al.¹³ (2017) used three social-information messages in a field experiments conducted in the UK. The messages are: (i) "Nine out of ten people pay their tax on time", (ii) "Nine out of ten people in the UK pay their tax on time", (iii) "Nine out of ten people in the UK pay their tax on time, you are currently in the very small minority of people who have not paid us yet". These messages, and particularly the last one, had a significant positive effect on tax compliance.

program. If negative information flows within a community and its members can blow the whistle on those who under-report income to tax authorities, then this could drastically reduce the frequency of tax evasion. The potential benefits from introducing a whistleblower program must be weighted against the marginal costs of operating such a program (public resources would have to be dedicated to taking calls in from whistleblowers and to investigations of whistleblowers' claims). However, the economic experiments conducted in Moldova show that the mere threat of whistleblowing can act as a powerful incentive for individuals to avoid engaging in tax evasion. In fact, the experiments conducted in Moldova show that participants are very sensitive to being audited in an environment where others can blow the whistle. Therefore, although the introduction of a whistleblower program would require initial public investments to ensure its proper functioning, the data suggest that the program may work as a mere threat in the long run and would require fewer public resources.

Contrary to what economic theory would predict, tax compliance cannot be achieved by a drastic increase in penalties holding the probability of detection at very low levels. It is therefore important for taxpayers to know that there is a reasonable chance that their tax declarations will be audited. Similarly, increasing the probability of detection from 20% to 40%, while simultaneously reducing the penalty from 50% of the due taxes to 25%, is not an effective policy to reduce tax evasion.

The experimental data indicate that the optimal policy in terms of detection and penalty is when public authorities implement a balanced combination of the probability of detection and penalty size. The two are therefore complements rather than substitutes. The main motivation behind the experimental manipulation of detection probability was to test for the standard economic prediction that tax authorities can spend less resources on monitoring by having very high penalties. The extreme case is when the probability of detection is close to zero – and thus few resources are allocated to monitoring – while the penalty is extremely high. The data from our experiments clearly show that public authorities need to ensure a reasonably high detection probability coupled with a reasonably high penalty. However, it is important to keep in mind that penalties that are too high may backfire since people may view them as unfair.