

Increasing the Payment Rate of the Garbage Collection Fee in the Slovak Municipality through the Behavioral Experiment¹

Anetta Caplanova¹, Eva Sirakovova^{2*}, Estera Szakadatova³

¹ prof. Anetta Caplanova, PhD., Professor, Department of Economics, University of Economics in Bratislava,
Dolnozemska cesta 1, Bratislava, Slovakia

² Eva Sirakovova, PhD., Assistant professor, Department of Economics, University of Economics in Bratislava,
Dolnozemska cesta 1, Bratislava, Slovakia

³ Estera Szakadatova, MSc., Doctoral candidate, Department of Finance, University of Economics in Bratislava,
Dolnozemska cesta 1, Bratislava, Slovakia

Abstract

In the paper we present the design of behavioral experiment in the municipality of Hlohovec, Slovak Republic. The main goal of the behavioral experiment is to solve the problem with non-payment of the garbage collection fee in this municipality. Using two intervention and a control group the intervention has been carried out in the phase of sending the invoice for the garbage collection. Two types of leaflets (social norm and deterrent ones) were sent to the subjects together with the invoice for garbage collection fee in Spring 2021. The subjects in the control group did not receive any leaflet and were sent only the invoice. The social norm leaflet pointed out that most residents pay the garbage collection fee on time and encouraged individuals to join the paying majority. The deterrent leaflet reminded subjects that if they did not pay the garbage collection fee on time, they would undergo enforcement proceedings. We expect both interventions to have statistically significant impact on the compliance with the payment of the garbage collection fee.

Keywords: behavioral interventions; behavioral economics; public policy; local public policies; garbage fee collection; compliance.

¹ This paper was prepared with the support of the project APVV – 18-0435 “Behavioral interventions in municipalities: Increasing the effectiveness of public policies”. This paper represents work in progress and comments are welcome. No part of this paper is to be cited unless an explicit consent of authors is sought.

1. Introduction

In recent years, the use of behavioral interventions in public policy making has become widespread. Not only at national, but also at regional and local levels, behavioral “nudges” and other forms of interventions have proven to be an efficient way of influencing the effectiveness of public policies in various areas.

When collecting taxes and fees, the responsible institutions often face the problem of non-compliance, i.e., the problem of non-payers. The fact that there are people who refuse to pay mandatory taxes and fees has significant implications for the functioning of the public sector. In the first place, it is associated with a loss of revenue— i.e., there are fewer resources available to perform the functions of public institutions at a given level, which may negatively affect the quality of provided public services. Thus, revenue shortfalls disrupt the possibilities for providing public goods, the design and implementation of public policies, but they also have an adverse impact on equality in terms of people's contribution to the public revenues.

Therefore, the failure to pay local taxes and fees not only represents a legal problem in terms of compliance with the legislation, but it is also an economic problem in terms of the need to accrue adequate resources for financing the needs of a municipality or a city, and it is also an ethical and moral problem in relation to those local residents, who comply with the payment of local taxes and fees.

The implementation of behavioral interventions to address the problem of non-compliance usually uses “framing”, which has been successfully tested in different behavioral settings. Usually the reformulation of the invoice, or accompanying leaflets is used and reflects findings of the behavioral research. The behavioral approach commonly uses interventions, which fulfill EAST characteristics, i.e., they are Easy, Attractive, Social and implemented in a Timely manner (The Behavioral Insights Team, 2014).

In this article, we present the behavioral experiment, which is focused on decreasing the share of non-payers of the garbage collection fee at the level of local government (at municipal level) in Slovakia. The intervention was implemented on the residential households in the municipality of Hlohovec, Slovakia, in Spring 2021.

The article is structured as follows. In the next section, we present a brief overview of relevant literature, then, we proceed to introducing the experimental design and the methodology used in this research, finally, we conclude with formulating preliminary conclusions. This article represents work in progress, since the collected data on the non-compliance with the payment of garbage fee will be available only at the end of 2021.

2. Literature review

Most experiments that aim to improve tax/fee payment compliance are carried out using the reminders to taxpayers. There is a control group to which a standard format reminder is sent without any intervention. Then, there is an experimental group(s) which is sent modified documents. Then, the data is collected and the effectiveness of alternative forms of behavioral interventions is studied. In different countries of the world this approach has been used to test the effectiveness of the use of framing of communication with subjects on their compliance with the payment of taxes and fees.

Between 1995 and 1996, experiments were implemented in Minnesota, USA, to promote the tax compliance (Coleman, 2007). The intervention took the form of reminder letters, which contained an element focused on morality and confronted taxpayers with perceived social norms. Taxpayers were divided into two groups – a control group, which received a standard reminder about the need to pay tax, and an intervention group, which received a reminder with the reference to the moral obligation to pay taxes. In a letter using the social norm, it was reported that 93 percent of people paid taxes on time. The results of this experiment confirmed that tax collection was statistically significantly higher in case of those taxpayers, who received the communication containing reference to the social norm as compared with the control group.

Hernandez et al. (2017) carried out a field experiment in Poland to increase the share of compliant taxpayers. They focused especially on income tax evaders. Experimental groups received reminders, which used various wording, for example, the so-called common behavioral reminder was prepared in accordance with the conclusions of behavioral science that less text and simpler formulation should be used, important dates and data should be aggregated at the beginning of the document. In addition to a reminder containing edits based on these findings of behavioral science, seven other types of modified reminders were used, such as the formulation with social norm, deterrence, negative or positive attitude to the public goods, etc. This research confirmed that behavioral letters resulted in a statistically significant increase in the share of taxpayers. The largest positive impact was observed in case of a deterrent reminder, which led to a decrease of late taxpayers by 8.4 percentages. The smallest impact was achieved by a design which informed that non-payment of taxes had impact on financing of public goods such as schools, roads, and security. However, the observed increase in taxpayer compliance was 6.1 percent.

In two large-scale natural field experiments Hallsworth et al. (2017) tested the effect of social norm messages on tax compliance. Authors used administrative data from more than 200,000 individuals in the United Kingdom and showed that including social norm messages in standard reminder letters increases payment rates for overdue tax. Their results provide a rare example of social norm messages affecting tax compliance behavior in a real-world setting. It was also

2nd International Conference on Social Sciences, Humanities and Arts

found that all letters sent to the experimental groups were successful and led to an increase in the proportion of taxpayers. In terms of increasing the number of taxpayers, the letters that used social norms were most successful. Documents pointing to a lack of public services due to budget shortfalls did not lead to significantly better results than documents pointing to the benefits of paying taxes in relation to the provision of public goods. This field experiment was replicated a year later to check whether the effectiveness of these changes declined over time. Reminders using behavioral nudges were shown to have impact also in the following year.

Experiments were carried out in Norway between 2012-2013 to increase the collection of foreign income taxes (Bott et al., 2017). Before the intervention, taxpayers reported income earned abroad without any prompt. During the intervention taxpayers were divided into four groups, one control group and three experimental groups. The control group did not receive any communication from the tax office. The first intervention group received a letter containing general information on how and when to file a foreign income tax return and a link to the website where taxpayers could find more information. The subjects in the second experimental group were divided into two subgroups. In both cases, a moral appeal was used, but in the first group it focused on the notion of justice and in the second group on social benefit. In the focus on justice a sentence was added stating that most taxpayers paid foreign income tax on time and honestly. The focus on social benefits pointed out that the payment of taxes brings taxpayers benefit since it makes available funding for public services, e.g., education, health care etc. The last experimental group received a letter stating that the Norwegian tax authorities were aware that the taxpayer had taxable income from abroad. This sentence was intended to force taxpayers to update their subjective beliefs about the probability of an audit in the next fiscal year. All letters sent had a positive effect on the amount of taxes collected compared to the control group. Following the intervention, Norwegian tax authorities managed to increase the revenue from the foreign income tax by USD 25 million. The largest impact was observed from social norm letters and letter containing the information observed by the tax office about the taxable income from abroad.

Dwenger et al. (2016) studied extrinsic and intrinsic motivation for tax compliance in the context of a local church tax in Germany. The authors used three schemes to motivate taxpayers: simplification of tax payment; different ways of discouraging non-payment of taxes; rewards for compliance with regulations such as social recognition, inclusion in a cash prize draw or a combination of the three. Based on this study the authors conclude that intrinsic motivation has a positive effect, while extrinsic motivation has a negative effect on tax compliance. This suggests that rewarding taxpayers for contributing to the financing of public goods (instead of punishing them for not paying taxes) sends a signal that the tax system contains also voluntary aspects.

2nd International Conference on Social Sciences, Humanities and Arts

Castro and Scartascini (2015) conducted an extensive field experiment in one of the municipalities in Argentina. They sought to affect the level of compliance with the payment of property (real estate) tax by focusing on different aspects of compliance, i.e., the reciprocity associated with the use of tax revenue and the impact of the attitudes of other taxpayers in the municipality. The results suggest that the information sent to discourage taxpayers from paying the tax (e.g., informing taxpayers about tax collection and fines for non-compliance) had a positive, statistically, and economically significant impact on compliance, since it increased tax compliance by almost 5 percentage points. On the other hand, information on how taxes are paid by others in the municipality or how the municipality uses the tax revenue did not have a statistically significant effect. However, the results suggest that information on the use of collected revenues as well as on behavior of other taxpayers had statistically significant effect. After taking into account individual characteristics of subjects, those who complied with tax rules in the past had the tendency to behave in the same way after having received the information how others comply with the tax rules.

Lamberton (2013) concluded that the possibility for taxpayers to decide on the use of part of their taxes can increase the benefits they derive from paying taxes and increase tax compliance. For example, if taxpayers are provided with the opportunity to direct part of their taxes to specific services provided by the government (e.g., to allocate part of their taxes to education, community development, etc.) that can increase their tax compliers.

3. Experimental design and methodology

3.1 Experimental design

The municipality of Hlohovec faces the problem with the collection of garbage fees. Therefore, we have carried out the intervention focused on increasing the compliance with the payment of this fee. In standard situation, the municipality sends a reminder to those, who fail to pay the fee on time. If the subjects do not pay the fee even after the deadline for later payment, the recovery procedure and the enforcement proceedings are taken over by the legal department of the municipality.

The goal of the behavioral intervention is to maximize the desired behavior, i.e., to increase compliance with the garbage fee collection in this municipality. This experiment could be easily replicated also in other municipalities and thus, the results of this experiment could also contribute to increasing the effectiveness of public policies in other local governments. This intervention can also serve as an inspiration for the design of similar interventions at the national level aimed to improve tax collection, e.g., in case of personal income tax.

2nd International Conference on Social Sciences, Humanities and Arts

In the experiment, we have used leaflets that were sent together with the invoice for the garbage collection fee to physical entities in the municipality via regular mail, i.e., electronic communication channels were not included in the experiment.² The households were divided into three groups, a control group (households in this group did not receive any leaflet and were sent only the invoice) and two experimental groups (households in one group receiving a deterrent leaflet and households in the second group social norm leaflet). There were approximately 3000 households in each group.

The households in the first intervention group received a deterrent leaflet, which reminded them that if they did not pay the fee on time, enforcement proceedings would follow. This leaflet was aimed to increase subjective perception of recipients of the existing enforcement proceedings in case of non-compliance.

The households in the second experimental group received a social norm leaflet together with invoice for the garbage fee with the information on the rate of tax payment compliance by other households in the municipality. As suggested by previous research (Dell'Anno, 2009; Castro and Scartascini, 2015), the aim of this leaflet was to affect households' perceptions of the degree of tax compliance by other citizens in the municipality. It is expected that after having received this leaflet, households would adjust their perceptions of tax compliance upwards and increase their own compliance.

Thus, the primary hypothesis of our research is the following:

H₀: „The use of appropriate behavioral nudges will lead to the change of individual behavior and increase the compliance with garbage fee collection compared to the control group and the time period before the intervention.” By referring to the enforcement proceedings in place for non-compliance and by referring to social norms we expect that the non-compliance with the garbage collection fee will be decreased compared to the control group and the period before the intervention.

This experiment has been implemented in Spring 2021. The data collected will be available by the end of 2021 due to the time frame for the payment of the garbage fee. After the data becomes available the detailed analysis will follow to verify the validity of the hypothesis. In addition to an overall analysis of whether behavioral nudges can help improve compliance with the garbage fee collection regulation.

4. Methodology

The main analytical tool we will use to identify the effect of the behavioral intervention on garbage fee collection is the difference-in-differences (DID) method. This method allows us to

² The English version of leaflets used is provided in the Appendix.

analyze the causal effect of the introduction of individual forms of behavioral interventions. The DID method makes it possible to compare individual compliance with fee collection and with the control group before and after the intervention.

Additionally, we will supplement the difference-in-differences analysis with a linear probability model (Probit). We will use this model mainly to evaluate the impact and the effectiveness of individual interventions. Below, we specify the regressions that will be used to evaluate the impact of the implemented intervention on fee payment compliance.

Difference-in-differences model specification:

$$T_{it} = \alpha + \beta_1 Treat_{ij} + \beta_2 After_t + \delta(Treat_{ij} \times After_t) + \gamma X + \varepsilon_t \quad (1)$$

where the dependent is the declared garbage fee payment T_{it} of individual i in period t , $Treat_{ij}$ is a binary variable taking value 1 if individual i is in an intervention group j , $After_t$ is a binary variable taking value 1 for observations during the intervention period, $Treat_{ij} \times After_t$ is a variable indicating the effect of intervention j on individual i during the intervention period t , X is a vector of control variables representing tax payer specific characteristics such as gender, age, employment status, marital status or type of property, and ε_t is the standard error.

The coefficient of our interest is δ which represents the difference-in-differences estimate – it expresses the effect of the intervention j on the treatment group. We expect this coefficient to be positive for intervention T1 and T2 since we expect the proposed behavioral interventions to have a positive effect on the collection of the fee in the municipality of Hlohovec.

Linear probability model specification:

$$Prob(i \text{ comply}) = \alpha + \theta I(Treat_i = j) + \pi X + u_i \quad (2)$$

where the dependent variable is a binary variable $Prob(i \text{ comply})$, which indicates whether individual i complies with the garbage fee collection, $I(Treat_i = j)$ is a binary variable taking value 1 if an individual i is in the treatment group j , X is a vector of control variables as outlined above in equation (1) and u_i is the standard error. θ is the coefficient of our interest that represents the effect of intervention j on tax compliance of individual i (i.e., the binary outcome variable $Prob(i \text{ comply})$).

5. Conclusion

Many studies confirmed that behavioral insights can be used in a wide range of policy areas. The behavioral approach should be used as an integral part of up to date public policies. Previous research on tax compliance has shown that framing around tax choices can be very effective for increasing the number of taxpayers.

**2nd International Conference on Social
Sciences, Humanities and Arts**

In this study, we present the design of the behavioral experiment aimed at increasing compliance with the garbage collection fee in the Hlohovec municipality, Slovakia. In this behavioral experiment, we test two types of interventions and use a control group to allow for the determination of treatment effects. The deterrent intervention and the social norm intervention will be tested for their significant impact on the payment on the behavior of households regarding compliance with the payment of garbage fee. In line with the literature, we expect that the interventions will have positive effect on compliance with the fee collection and will be replicated in similar settings elsewhere. It is open for further research to find out whether the expected effects will be of short-run, or long-run nature.

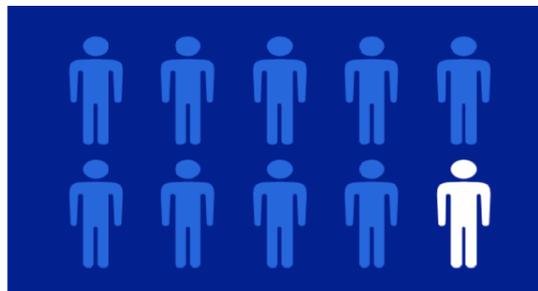
References

- The Behavioural Insights Team. (2014). *EAST-Four simple ways to apply behavioural insights*. https://www.bi.team/wp-content/uploads/2015/07/BIT-PublicationEAST_FA_WEB.pdf
- Bott, K. M., Cappelen, A. W., Sorensen, E., & Tungodden, B. (2017a). You've Got Mail: A Randomised Field Experiment on Tax Evasion. *SSRN Electronic Journal*. Published. <https://doi.org/10.2139/ssrn.3033775>
- Castro, L., & Scartascini, C. (2015). Tax compliance and enforcement in the pampas evidence from a field experiment. *Journal of Economic Behavior & Organization*, 116, 65–82. <https://doi.org/10.1016/j.jebo.2015.04.002>
- Coleman, S. (2007). The Minnesota Income Tax Compliance Experiment: Replication of the Social Norms Experiment. *SSRN Electronic Journal*. Published. <https://doi.org/10.2139/ssrn.1393292>
- Dell'Anno, R. (2009). Tax evasion, tax morale and policy maker's effectiveness. *The Journal of Socio-Economics*, 38(6), 988–997. <https://doi.org/10.1016/j.socec.2009.06.005>
- Dwenger, N., Kleven, H., Rasul, I., & Rincke, J. (2016). Extrinsic and Intrinsic Motivations for Tax Compliance: Evidence from a Field Experiment in Germany. *American Economic Journal: Economic Policy*, 8(3), 203–232. <https://doi.org/10.1257/pol.20150083>
- Hallsworth, M., List, J. A., Metcalfe, R. D., & Vlaev, I. (2017). The behavioralist as tax collector: Using natural field experiments to enhance tax compliance. *Journal of Public Economics*, 148, 14–31. <https://doi.org/10.1016/j.jpubeco.2017.02.003>
- Hernandez, M., Jamison, J., Korczyk, E., Mazar, N., & Sormani, R. (2017). Applying Behavioral Insights to Improve Tax Collection. *World Bank Group - E-Library*. Published. <https://elibrary.worldbank.org/doi/abs/10.1596/27528>
- Lamberton, C. (2013). A Spoonful of Choice: How Allocation Increases Satisfaction with Tax Payments. *Journal of Public Policy & Marketing*, 32(2), 223–238. <https://doi.org/10.1509/jppm.11.084>

**2nd International Conference on Social
Sciences, Humanities and Arts****Appendix: English version of leaflets****A. The Deterrent Leaflet**

**Pay the garbage fee within
the given deadline and
avoid an executive order!**

**If you do not pay the garbage fee
within the given deadline, you may be
put under enforcement proceedings!**

B. The Social Norm Leaflet

**JOIN THE PAYING
MAJORITY!**

**Did you know that 9 out of 10
citizens of Hlohovec pay garbage
fee on time? Become a part of
PAYING MAJORITY and pay the
garbage fee within the given
deadline!**

