

Behavioural Interventions in Tax and Fee Collection – Not Always a Success

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Abstract Intergovernmental relations in terms of fiscal arrangements between the national and sub-national levels of government determine the way in which taxes are allocated and shared between the various levels of government. For local governments, local taxes and fees are the main source of revenue through which many public services are provided. Many local governments therefore seek to use various tools to increase the effectiveness and efficiency of tax and fee collection. Such tools include behavioural interventions to reduce the proportion of non-payers, i.e. taxpayers can be ‘nudged’ to pay their taxes on time and correctly. Many studies worldwide point to the successful use of nudges, but behavioural interventions can sometimes fail. Using the example of the Slovak city of Banská Bystrica, we show that the intervention did not produce the expected results and identify possible factors.

Keywords: • behavioural interventions • nudge • tax and fee Collection • Slovakia

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1 Introduction

Behavioural insights-based changes in public policies mainly use behavioural nudges and change the choice and setting of default options. The concept of nudges thus presents ways to ethically influence the behaviour of a target group of people in a desired direction. The role of nudges is to steer individuals towards a particular goal. Nudges come in different forms and shapes, depending mainly on the nature of a particular decision-making process and the deviations of rationality that arise in it. Even small and insignificant details can greatly influence people's behaviour and decision-making. People need to be nudged in situations where they do not know the right response. These are complex and infrequent decisions where they do not have clear and immediate feedback or have difficulty translating all aspects of a situation into language they understand (Thaler & Sunstein, 2008).

Changing people's behaviour (behavioural insights) is an important aim for policy-makers, municipalities, healthcare providers, educators, researchers etc. (Michie, Atkins, West, 2014b). It builds on lessons derived from behavioural and social science, including decision making, psychology, cognitive science, neuroscience, organizational and group behaviour (Hansen, 2018). Changing ingrained behaviour patterns can be challenging. Even when we know what we are trying to achieve, we may lack the time, the multidisciplinary team, access to those whose behaviour needs to change, an understanding of behaviour change theories or the knowledge and skills relevant to changing behaviour (Bernheim & Taubinsky, 2018; Michie, Atkins, West, 2014b). Behaviourally informed public policy is distinguished from traditional public policy making by (1) taking an inductive approach that is driven by experimentation and piloting, and (2) use of psychological theoretical underpinnings. Behavioural insights then challenge established assumptions of what is thought to be rational behaviour of citizens and businesses and use these findings to inform policies and regulation (Hansen, 2018).

The introduction of behavioural interventions in public policy making is also used in the area of tax and fee payment. In the collection of taxes and fees, there is often a problem of tax evasion. Although this is an illegal act, the solution to this problem is not simple (Allingham & Sandmo, 1972; Yitzhaki, 1974).

Some authors suggest tax audits are important in solving this issue (Hauptman et al. 2014). According to Allingham & Sandmo (1972) the tax declaration decision is a decision under uncertainty. The reason for this is that failure to report one's full income to the tax authorities does not automatically provoke a reaction in the form of a penalty. At the same time, less public revenue is collected at central or local level and fewer resources are available to provide public services. As Románova et al. (2019) pointed out in their research, the local government units do not have adequate powers to impose and collect local taxes.

There is also an ethical dimension to this problem where people who benefit from publicly provided services do not contribute to these services to the extent that they are legally obliged to do so. Addressing this problem is therefore important not only because non-payment of taxes results in revenue shortfalls in local government budgets but it also has an impact on the behaviour of taxpayers themselves. Taxpayers who pay their taxes and fees may feel that they bear the tax burden, while non-payers benefit from public services as much as those who fulfil their obligations. This may be perceived as unfair and may negatively affect their behaviour in terms of paying taxes and fees in the future. Non-payment of local taxes and fees is therefore not only a legal problem in terms of compliance with legislation, an economic problem in terms of obtaining adequate resources to ensure the financing of the needs of the municipality or city, but also an ethical and moral problem in relation to the residents of the municipality who pay local taxes and fees (Jakuš Muthová et al., 2022). According to Allingham & Sandmo (1972) the policy tools available to the government for the purpose of counteracting the tendency to evasion are the tax rates themselves, the penalty rates and the expenditure on investigation, which determines the probability of being detected.

Several studies (e.g. Hernandez et al., 2017; Hallsworth et al., 2017; Kettle et al., 2017; John & Blume, 2017; the Behavioural Insights Team, 2018) have confirmed that the use of a behavioural intervention can be a suitable tool to reduce the proportion of non-payers, i.e. taxpayers can be ‘nudged’ to pay taxes on time and correctly. The application of behavioural interventions to tackle problems with defaulters is usually done by sending out arrears notices that contain behavioural elements. Compared to standard reminders, the effectiveness of such reminders is generally higher.

In the conditions of the Slovak Republic, the use of behavioural economics is only in its beginnings, the first nudges took place in the city of Prievidza in 2018 (Sloboda et al., 2020) with a positive impact. Academia has thus started to work with local governments to implement further behavioural interventions in different areas to further explore the possibilities of applying this tool. The aim of this paper is to analyse an experiment implemented in the area of tax and fee collection in the city of Banská Bystrica, with the intention of highlighting the factors behind the fact that the interventions in this case did not turn out as expected. The main methods used are a behavioural experiment on a sample of 520 tax payers. The results in this particular city show that the intervention did not produce the expected results; we discuss other examples of Slovak local governments that show the positive effect of behavioural interventions in the area of tax and fee collection.

In the first part of the paper, we review behavioural interventions in tax and fee collection. We then present a selected local government focusing on its revenues from taxes and problems connected with tax and fee collection. We implemented the behavioural intervention in the form of a randomised controlled experiment, which is described in the

Research Concept section, including the statistical methods used to evaluate the experiment. The next section presents the results of the experiment and a discussion with the results of similar experiments in other Slovak municipalities. In the Conclusion we summarise the main points of the paper and point out the limits of our research.

2 Literature overview

A number of local governments around the world are currently implementing behavioural interventions. Many times, it is the most efficient and least costly way to nudge citizens to make the right decisions that will benefit the citizen, the local government and society as a whole.

When designing and implementing an experiment aimed at increasing tax and fee payment rates, one can take inspiration from the many studies that have emerged from successful previous experiments in this area. In this overview, we list a number of such experiments and studies.

Between 1995 and 1996, experiments aimed at increasing tax compliance were conducted in Minnesota, U.S.A. The intervention used a reformulation of reminders that appealed to taxpayers to pay their taxes and confronted taxpayers with perceived societal norms. Members of the intervention group received a tax payment reminder with a social norm message. The reminder focused on calling attention to social norms and stated that 93 percent of people pay taxes on time. The results of this intervention confirmed that tax collection was statistically higher for those subjects who received a reminder with a social norm reference compared to subjects in the control group (Coleman, 2007).

The British Behavioural Insights Team (BIT) tested how social norms can be used to motivate defaulters to pay their taxes (Halpern, 2015). Non-payers are sent reminders, which they supplement with text pointing to social norms. Some reminders emphasised that the vast majority of people in the recipient's immediate area paid the tax on time, but the geographic area was not precisely named. In an alternative formulation, the text of the reminder emphasised that most similar debtors had already paid the tax. Some defaulters received letters that combined both pieces of information. The results showed that the more specific the text of the reminder letter was, the more likely the defaulter was to pay the tax. If the text combined both emphasised information, the proportion of tax paid by defaulters increased by 5 per cent. Thus, in the 2012/13 financial year, in the UK, sending reminders highlighting social norms led to additional tax revenue of GBP 210 million. Another way to increase the effectiveness of communication with citizens that can be used in tax collection is through personalisation of messages. In an experiment targeting non-payers of road tax, the BIT found that sending reminders accompanied by a photograph of a vehicle for which road tax had not been paid increased tax collection by 9 per cent. This intervention was based on the assumption that if people receive a personalised letter from a public institution, it will reduce the costs and benefits associated

with the action to which the letter refers. For example, if an entity that has failed to pay its tax on time receives a personalized letter using moral norms describing the possible consequences of noncompliance, the recipient may feel that public institutions have accurate and detailed information about their actions and will consider the consequences described in the letter to be very real.

In Canada, an experiment was conducted among employers who had been late paying tax in previous years. Letters containing nudges provided information on where and when to file a tax return. This intervention resulted in a 4.2% increase in tax payments in the first year and a 6.1% increase in the second year compared to the control group (OECD 2017).

Moving from Anglo-Saxon environments to European contexts, experiments were conducted in Norway in 2012-2013 to increase the collection of foreign income taxes (Bott et al., 2017). Prior to the intervention, taxpayers reported the amount of foreign income without any prompting. In the intervention, taxpayers were divided into four groups, one control and three intervention groups. The control group did not receive any letter from the tax authority. Subjects in the intervention groups were sent a letter. All the letters that were sent had a positive effect on the amount of taxes collected compared to the control group. During the intervention, the Norwegian Tax Authority was able to increase the tax revenue by USD 25 million. The most important contributors to the increase in tax collection were the wording of the letters that referred to social norms and to the fact that the tax office had information on the individual's income from abroad.

In 2014-2015, an experiment was carried out in Ireland to show how the wording of reminder letters based on personalisation and simplification of the text would affect tax defaulters. The experiment focused on taxpayers who had not filed their tax returns on time and were in arrears with their corporation tax payments. A generically worded letter was sent to some companies. A reminder was sent to a second group of companies stating that, according to information from a third party, the company was still in business. Compared to the broadly worded text, this change in wording alone led to a 17 percent increase in delinquent tax filings. Another group of companies was sent a reminder with a simplified text that was shorter and contained only key information. Replacing complex legalese with clear and plain language led to a 3 per cent increase in the number of tax returns filed in Ireland in 2015 and resulted in around EUR 2.8 million in additional tax revenue. The results of this experiment also show that written communication between public institutions and citizens is more effective if it is written in plain language, clearly communicates the substance of the message right from the start, and is highly personalised (Service et al, 2017).

Hernandez et al., (2017) conducted a field experiment in Poland with the aim of increasing the share of personal income tax among those who did not pay their tax on time. The nationwide randomised evaluation included 149 952 taxpayers and examined how the wording of letters using nudges affects the payment rate, the amount of payment,

the unpaid tax liability, and what effect the method of letter delivery has (ordinary or registered). This research confirmed that changing the wording of the reminder letters led to a statistically significant increase in the proportion of those who paid the tax. Letters containing a nudge affected individuals' behaviour positively compared to a control letter; letters written in a coarse tone were more effective than letters with a soft tone, which were even less effective than standard letters, although effectiveness also depended on the characteristics of individual taxpayers. The method of letter delivery did not affect taxpayers' behaviour. The biggest positive effect was the so-called deterrent reminder, which led to an 8.4 % decrease in the proportion of non-payers. The smallest positive impact was caused by a reminder containing the information that non-payment of taxes negatively affects the financing of publicly provided goods or services such as schools, roads or defence and security. However, even sending this reminder increased the proportion of non-payers who paid the tax after the reminder (by 6.7% compared to the control group).

An experiment was conducted in Belgium which focused on income tax defaulters at the national level (Luts & Roy, 2019). They sent various reminder letters to taxpayers who had not paid their tax. They used 7 alternative letters (including a control group) in which they applied nudges of different nature. The first letter used social norms formulated in such a way that 95% of taxes in Belgium are paid on time. Another letter informed taxpayers about the areas that are financed thanks to taxes (education, health, etc.) and also a negative version of this letter. Other versions of the letters used, for example, heuristics, the status quo, loss aversion and informed about the fines for not paying taxes, or were a combination of several versions of the letters. The most effective version of the letter contained information about the fine. It resulted in a 20% increase in payments compared to the control group.

In the conditions of the Slovak Republic, where our experiment was carried out, interventions have also been implemented in this area. The Financial Administration of the Slovak Republic, in cooperation with the Institute of Financial Policy, the Value for Money Institute, the University of Economics in Prague and City University in London, launched an experiment aimed at making taxpayers aware of the obligation to pay income tax on the sale of real estate and thus increase the success rate of its collection. A taxpayer is legally obliged to file a tax return if they sell a property within 5 years of its acquisition or 5 years of its removal from business property. Between 2016 and 2019, there were over 15 thousand sales of real estate that could have been affected by this taxation, but only in one third of the cases was a tax return filed. These properties were identified based on changes in the real estate cadastre database, while most of the transfers, which are not subject to taxation according to the law, were excluded from the examined sample. The estimated annual loss in taxes and fees amounts to approximately EUR 22 million. The identified entities that may have incurred a tax liability were subsequently divided into two groups based on the time of the tax liability: potential debtors and potential taxpayers. The essence of the experiment was to find out which type of notice works best for

potential debtors and taxpayers. The identified subjects were therefore randomly divided into a control and test group before the letters were sent. Subjects in the control group did not receive any letter, while subjects in the test group were sent several forms of letters with different behavioural modifications (deterrent effect: threat of audit and threat of fines – letter contained also information on the probability of being audited and the penalty rate according to tax administration statistics or letter informed firms of the exact audit probability that was assigned to them, moral appeal saying– for example nine of ten people pay their tax on time, and implicit threat – there is no difference between omission and knowing non-payment of tax). The sending of the warnings generated an additional EUR 2.5 million for the state budget, of which approximately EUR 1.8 million were collected from potential debtors (ex-post) and approximately EUR 0.7 million were collected from potential taxpayers (ex-ante). This amount is already net of the control group, i.e. the amount of funds collected from entities to which no letter was sent. This confirmed that behavioural interventions are an effective method to reach tax debtors and to remind them to comply with their tax obligations at minimal cost to the public administration. This result suggests, among other things, that ignorance rather than a conscious effort by taxpayers to avoid paying taxes is behind non-compliance following the sale of a property. Based on the results of the experiment, the Tax Authority will send annual notices to taxpayers focusing on the obligation to declare the income from the sale of the property. Given the frequent failure to declare income from the sale of houses and flats, other types of real estate, such as land, will also be targeted in the near future (Rybošová et al., 2021).

At the local level, the introduction of the intervention was part of the Behavioural Policy for a Caring City project, which follows a global trend to use behavioural insights for the benefit of local residents. The Institute of Public Policy of the Faculty of Public Policy of the University of Economics in Bratislava and the Civita Center collaborated on the intervention. The intervention was implemented in May 2019, with the mapping of the city's agenda and the design of the intervention taking place between May 2018 and April 2019. The intervention not only tested the effectiveness of the municipal waste arrears reminder itself, but also tested the effectiveness of two types of framing - social norm and thank you. The intervention succeeded in collecting 7% of the total amount owed. The results of the regression analysis show that the most effective intervention is the reminder together with the social norm, which increased by 1.7 times the chance of paying at least part of the arrears. Further testing and replication of the research design is essential. However, initial testing suggests the potential of both the reminder tool and the framing of the challenge in the form of a social norm. It also shows that local governments should use reminders to reach out in particular to debtors who do not have a long history of non-payment (Civita Center, 2020).

Another proposed behavioural intervention aimed to increase the rate of payment of the municipal waste fee in Hlohovec. In the proposed experiment, leaflets were used, which were sent to individuals together with the municipal waste payment notice by regular

mail, i.e. the experiment did not include subjects who use an electronic form of communication with the city. Households were divided into three groups, with approximately 3 000 households in each group. Households in the control group did not receive any leaflet, they were only sent a standard fee schedule. Households in the first intervention group were sent a leaflet with the fee assessment aimed at deterring illegal behaviour, reminding them that if they did not pay the fee on time, distraint proceedings could follow. Households in the second intervention group received a leaflet with the fee assessment oriented towards a social norm, which took the form of information that the vast majority of households pay the fee. Consistent with previous research (e.g., Dell'Anno, 2009; Castro & Scartascini, 2015), the aim of the leaflet was to influence the perception of the rate of compliance with waste fee payment deadlines by other city residents. The results of the analysis showed that an intervention using a positive message (i.e. attaching a leaflet with a social norm) had a positive and statistically significant effect on the payment of the municipal waste fee in the post-intervention period. Subjects who received a notice to pay the municipal waste fee together with a leaflet from which they learned that the vast majority of citizens pay their municipal waste fees on time were also more likely to pay the fee on time than citizens in the control group who were only sent a payment notice (Čaplánová et al., forthcoming).

The above-mentioned studies use various models that decipher factors of human behaviour. An overview of the most commonly used models, which also underpin our proposed interventions, is provided in Table 1.

The COM-B (Capability, Opportunity, Motivation - Behaviour) model was developed by analysing existing models for behaviour change and designing behavioural interventions. Thus, it represents an integrative model that helps to determine what behavioural interventions are appropriate for a given type of problem. According to the COM-B model, behaviour is the result of a combination of physical and psychological fitness, physical and social opportunity, and last but not least, the reflexive and automatic motivation of its performers (Michie et al., 2011).

Dolan et al., (2012) defined the nine most significant factors influencing individuals' actions, referred to as the MINDSPACE concept. The premise is that individuals analyse information in the form of the myriad of cues available to them from politicians, the state, local governments and the market when making decisions, and the result is decisions that reflect, given these cues, their best interests.

In many experiments the behavioural approach is based on interventions that are called EAST: Easy, Attractive, Social and Timely. To make it easy the authors (Service et al., 2017) recommend harnessing the power of defaults, reduce the 'hassle factor' of taking up a service and simplify messages. Attractiveness is aimed at attracting attention and designing rewards and sanctions for maximum effect. Social in this concept means showing that most people perform the desired behaviour, using the power of networks and encourage people to make a commitment to others. To make the intervention timely

is to prompt people when they are likely to be most receptive, consider the immediate costs and benefits and help people plan their response to events.

Behavioural insights help explain not only why people fail to act, but what can be done to encourage people to take action. Created by the »Behavioural Interventions to Advance Self-Sufficiency« project team, the SIMPLER framework describes behavioural principles that were commonly applied across the project's interventions. The SIMPLER concept aims to increase and capture the attention of citizens and motivate them to become genuinely engaged in public policy problem solving (Anzelone et al., 2018).

Table 1: Models of factor influencing human behaviour

<i>Behavioural aspect according to the COM-B model</i>	<i>MINDSPACE concept</i>	<i>EAST concept</i>	<i>SIMPLER concept</i>
<i>Michie et al., 2011</i>	<i>Dolan et al., 2012</i>	<i>BIT, 2014</i>	<i>Anzelone et al., 2018</i>
PHYSICAL ABILITY - physical skill, strength or energy	Messenger - education, knowledge of the issue, appearance, gender, age, charisma of the leader, confidence	Easy	social influence
PSYCHOLOGICAL ABILITY - the knowledge or psychological skill, strength or energy to engage in the necessary mental processes	Incentives -incentives to perceive the situation - risk aversion, trust		implementation prompts
PHYSICAL OPPORTUNITY - an opportunity provided by the physical environment that includes time, resources, location, stimuli, and physical space	Norms - social (ethnicity, group size, group affiliation, different types of social groups), cultural, societal norms	Attractive	mandated deadlines
SOCIAL OPPORTUNITY - opportunity provided by interpersonal influences, social cues and cultural norms that affect the way we think about things, e.g. the words and concepts that make up our language	Defaults - repetition of a given situation, individual decision-making	Social	personalisation
	Saliency - clarity of message		loss aversion
REFLECTIVE MOTIVATION - reflective processes involving planning: conscious intentions and reassessment, assumptions about what is good and bad	Priming - the way the message is disseminated (advertising), the environment in which the message is disseminated, the acceptance by the individual		
AUTOMATIC MOTIVATION - automatic processes involving emotional reactions, desires, wants and needs, impulses and obstacles, reflexes and other motives	Affect - emotional associations	Timely	ease
	Commitments - commitment, individual's promise		
	Ego - success of the individual		reminders

Source: Own based on authors.

3 Research

The aim of the paper is to analyse an experiment implemented in the area of tax and fee collection in the city of Banská Bystrica with the intention of pointing out the factors that were behind the fact that the interventions in this case did not turn out as expected.

The city of Banská Bystrica (BB) is both a district and regional seat of local government, with a population of 78 484 inhabitants it is the sixth largest town in Slovakia. Real estate taxes constitute a significant part of the city's income, almost one-fifth (Table 2).

Table 2: Percentage share of real estate tax on current tax revenues of the city of BB for the years 2015 – 2020

Year	% share of real estate tax in current tax revenue
2015	19.43
2016	18.00
2017	17.10
2018	16.10
2019	15.56
2020	19.52

Source: Own based on Banská Bystrica's budgets.

A list of defaulters is published by the city by 31 December each year on its website, namely those whose arrears exceed € 160 in the case of a natural person and € 1 600 in the case of a legal entity.

The city sends a reminder to tax defaulters - a notice to pay every 2 years. If the debtors fail to pay the arrears even after the expiry of the deadline for payment set in the notice sent, the recovery of the arrears in the tax distraintment procedure is assigned to an external bailiff.

In addition to the service of summonses and the referral of cases for distraintment, the names of debtors are published on an electronic notice board. The list of debtors is published in accordance with Article 52 of Act No 563/2009 Coll., the list of tax debtors as at 31 December of the previous year whose aggregate amount of tax arrears exceeded € 160 for a natural person and € 1 600 for a legal person.

The City of Banská Bystrica registers approximately 4 440 real estate tax defaulters as of 18 October 2021 (Banská Bystrica, 2021). The total debt of natural persons amounts to approximately € 516 000. Arrears for municipal waste for individuals amounted to approximately € 1.65 million. In this case, there are 10 455 defaulters.

Interviews with representatives of the City of Banská Bystrica revealed that defaulters are often from socially disadvantaged groups making the recovery of arrears particularly challenging. The administration associated with sending notices and distraintment proceedings is also time-consuming, so the city was interested in trying to use behavioural intervention to increase the efficiency of tax and fee collection and reduce the number of defaulters.

The main objective of the experiment was to actively contribute to solving the problem of non-payers of local taxes and the local municipal waste fee in the city of Banská Bystrica through the use of behavioural nudging, and thus to maximise the desired behaviour of debtors - to pay the arrears of their local tax or fee. There are several types of local taxes in Slovakia: real estate tax, dog tax, vending machine tax, accommodation tax, and one local fee for municipal waste. Using a behavioural intervention, we investigated how defaulters react to different forms of behavioural nudges embedded in a leaflet that was part of a reminder sent to the debtor.

The experiment was conducted during the months of October and November 2021, when tax administrators typically send reminders to debtors (tax assessments are sent in May), by sending leaflets containing a simple infographic reflecting a particular type of nudge to reinforce their effect. Leaflets were sent to defaulters assigned to each intervention group (Intervention Group 1 - Moral norm leaflet, Intervention Group 2 - Social norm leaflet, Intervention Group 3 - Fear of loss intervention leaflet), together with an invitation to pay the tax arrears.

The first leaflet using the moral norm emphasised the fact that if the defaulter paid the arrears, they would become part of the paying majority (first leaflet in Figure 1). In designing the leaflet and using this moral norm, we were inspired by successful experiments (e.g. Hallsworth et al., 2014; Popper, 2015; Hernandez et al., 2017, Kettle et al., 2016, Sičáková-Beblavá et al., 2019) where the effectiveness of such a nudge has been demonstrated. The effectiveness of moral norms is mainly ensured by social opinion, as they evaluate the behaviour of citizens. Moral norms include honesty, fairness, responsibility, etc.

The leaflet sent to the second group refers to social norms, and in particular to a person's belief that he or she should act in a certain way. When creating the leaflet, we focused on belonging to a group of people who share the same surname (leaflet 2 in Figure 1). A social norm, broadly defined, is any information about the standard of behaviour of other members of a particular social group (Cialdini et al., 1990). A social norm can take several forms. A descriptive norm describes how others in the group behave. An injunctive norm describes a popular assumption about what should be right and wrong behaviour in a group.

A leaflet created for the third group is intended to be intimidating. It encourages defaulters to pay the tax assessed to avoid distraintment proceedings. The leaflet works with the concept of loss aversion and informs the defaulters that "There is a high probability that if you are found to be irregular in paying your taxes, your case will be referred to distraintment proceedings and, among other things, your driving licence may be revoked, or the arrears withdrawn from your pension, salary or account" (Fig.1, leaflet 3). This information is intended to make the defaulter feel the importance of paying the tax and the possible consequences of not paying the tax. The defaulter should take action to avoid loss from non-compliance. Loss in this case may include the withdrawal of a driving licence, so the leaflet also features a graphic representation of a car to attract attention. Factors influencing people's decision on how to behave have been addressed in a number of studies. Deterrence by drawing attention to the risk and/or cost of detection provides people with a rational reason not to do such and such behaviour (Iyer et al., 2010). Fear of norm violation, nonconformity, and social pressure have been used effectively in public administration several times in the context of energy, waste management, and recycling, as well as elections (Allcott, 2011; Cialdini & Goldstein, 2004; Gerber & Rogers, 2009; Schultz, 1999).

All three intervention leaflets were created in the same style and the typical colours of the city, the red and white stripes, which can be found on the coat of arms and flag of Banská Bystrica, can also be seen. The leaflets were consulted with the city's economic department to provide correct and truthful information.

Figure 1: Leaflets used in the implementation of the experiment in Banská Bystrica

Pridajte sa k platiacej väčšine!

Vedeli ste, že 9 z 10 daňovníkov v meste Banská Bystrica už miestne dane a poplatok za komunálny odpad zaplatilo?

Pridajte sa k platiacej väčšine

Viete, že ľudia s rovnakým priezviskom ako Vy platia miestne dane a poplatok za komunálny odpad včas?

Zaplať a vyhneš sa exekučnému konaniu!

Je vysoká pravdepodobnosť, že po zistení nezrovnalosti v platení miestnych daní a poplatku za komunálny odpad, bude Váš prípad postúpený do exekučného konania, a mimo iného, môže Vám byť odobraný vodičský preukaz, alebo nedoplatok stiahnutý z dôchodku, zo mzdy alebo z účtu.

Source: Own.

*Translation of the text on leaflets:

Join the paying majority! - Moral norm letter

Did you know that 9 out of 10 taxpayers in Banská Bystrica have already paid their local taxes and municipal waste fee?

Join the paying majority! - Social norm letter

Did you know that people with the same surname as you pay their local taxes and municipal waste fee on time?

Pay up and avoid distraint proceedings! - Threatening letter

There is a high likelihood that if you are found to be in arrears in paying your council tax and council tax, your case will be referred to distraint proceedings and, amongst other things, your driving licence may be revoked or the arrears taken from your pension, wages or account.

The experiment involved 520 tax subjects, 130 subjects in each intervention group and 130 subjects in the control group. The Economic Department randomly selected the tax subjects, i.e., the randomization was fully in their hands. The tax subjects were non-payers of real estate tax, dog tax and local municipal waste tax.

As part of the experiment, basic data on all 520 tax subjects were collected after the leaflets had been sent out. The type of tax for which the taxpayer is in arrears, the amount of the arrears (as well as the amount of the paid and unpaid part of the arrears) and whether or not the taxpayer accepted delivery of the leaflet sent by the municipality were recorded. Out of 520 tax subjects, 393 (75.58 %) accepted the notice to pay the tax arrears or the reminder. The remaining 127 tax subjects did not take delivery of the notice.

Table 3: Number of leaflets eventually reached the recipients

	Number of letters sent	% of tax subjects accepted the notice to pay	% of tax subjects did not take delivery of the notice
Control group	130	77%	23%
1. group (moral norm)	130	75%	25%
2. group (social norm)	130	75%	25%
3. group (fear of loss norm)	130	75%	25%
Total	520	393	127

Source: Own.

There was no significant difference in the number of notices taken up and not taken up (75.38 % i.e., 98 taken up in Groups 1 and 2; 74.61 % i.e., 97 taken up in Group 3 and 77 % i.e., 100 taken up in the control group).

We used descriptive statistics (e.g. the number of defaulters who paid the tax after the notice, the total value of summonses paid, etc.).

4 Discussion

In the table below, we report the arrears payment rate by each experimental group monitored.

Table 4: Baseline experimental results by group

Group	Amount in €	Amount in %	Number of appeals	Effectiveness - % of taxes/fees paid on the notice received
Control group				
Unpaid notices	€ 8 471.26	50.60%	75	75
Notices outstanding	€ 8 270.65	49.40%	55	
Total	€ 16 741.91	100%	130	
1. group (moral norm)				
Unpaid notices	€ 6 457.23	52.99%	66	67.35
Notices outstanding	€ 5 727.78	47.01%	64	
Total	€ 12 185.01	100%	130	
2. group (social norm)				
Unpaid notices	€ 4 487.28	43.76%	69	70.41
Notices outstanding	€ 5 767.88	56.24%	61	
Total	€ 10 255.16	100%	130	
3. group (fear of loss norm)				
Unpaid notices	€ 3 956.19	34.13%	53	54.64
Notices outstanding	€ 7 635.03	65.87%	77	
Total	€ 11 591.22	100%	130	

Source: Own.

The most successful group was the control group, in which 75 arrears totalling € 8 471.26 were paid and 30 arrears totalling € 8 270.65 remained unpaid. In terms of intervention groups, the second intervention – social norm group was the most successful. Our results are similar to Halpern (2015), Civita Center, 2020; Dell'Anno, 2009; Castro & Scartascini, 2015, where the results showed that the more specific the text of the reminder letter was, the more likely the defaulter was to pay the tax. In our case, the surname of the individual was decisive.

The intervention in this group appears to have been effective, although it is not possible to clearly identify the proportion of the impact of the intervention and other factors that may have influenced the decision of the defaulters. In terms of the number of notices

taken up, the first intervention group was third. There were 66 notices paid, representing 51 %. The total amount of arrears paid was € 6 457.23. Last in terms of both receipt of reminders and payment of arrears was surprisingly the fourth group with the notice for possible loss due to non-payment. It can be stated that a total of 188 out of 390, i.e. 48.20%, of the arrears were paid within the intervention groups. In the control group, which did not receive the reminder leaflet, 75 arrears out of 130, i.e. 57.69%, were paid. Based on the above results, the behavioural intervention appears to be unsuccessful. Contrary to our results Pomeranz and Vila-Belda (2019) claim that nudges implemented by tax authorities are more effective in shifting perceptions of audit probabilities than perceptions of social norms.

To further analyse the effectiveness of the intervention, we examined the impact of the interventions on the different tax and fee groups whose arrears were targeted by the experiment. Table 5 presents the results of the comparison.

Table 5: Evaluation of the experiment by type of tax and local fee

Type of tax/fee	Group	Number of notices	Number of notices received	% of notices received	Amount of arrears paid on receipt of the notice	Total amount of arrears paid	% effectiveness - amount of arrears upon acceptance/amount of arrears paid
Real estate tax	Control group	50	34	68.00%	1 728.3	1 833.3	94.27%
	1. group	50	38	76.00%	1 777.45	1 872.95	94.90%
	2. group	40	32	80.00%	787.2	787.2	100.00%
	3. group	50	38	76.00%	911.75	1 198.01	76.11%
Dog tax	Control group	19	17	89.47%	299	335	89.25%
	1. group	19	15	78.95%	428	428	100.00%
	2. group	20	15	75.00%	582	618	94.17%
	3. group	19	14	73.68%	432	540	80.00%
Municipal waste fee	Control group	61	49	80.33%	6 270.02	6 302.96	99.48%
	1. group	61	45	73.77%	4 156.28	4 156.28	100.00%
	2. group	70	51	72.86%	2 928.78	3 082.08	95.03%
	3. group	61	45	73.77%	2 202.08	2 218.18	99.27%

Source: Own.

In the table, we see that in terms of the effectiveness of each intervention in relation to the selected tax or fee, the intervention using the social norm in the case of property tax has been shown to be potentially effective. All those who received the notice and leaflet also paid the arrears. For the dog tax and, similarly, for the municipal waste fee, an

intervention based on a moral norm, pointing out that 9 out of 10 taxpayers had already paid the tax or charge, appeared to be the most effective intervention.

Although overall it appeared that the intervention was unsuccessful and did not meet our expectations, a deeper analysis of the results of the experiment points to the fact that individual types of interventions had a different effect on the behaviour of the residents and on inducing their activity. A number of factors may have influenced the results achieved by the experiment:

- **Communication with the city of Banská Bystrica** was promising at the beginning, with both the mayor and the deputy mayor pledging support for the experiment. However, when it came to the implementation of the experiment, officials from the Economic Department declared that they could not provide the necessary information and that participation in the experiment would be contrary to the legislation of the Slovak Republic. The research team had to argue that similar experiments had been conducted in the municipality of Prievidza and therefore there was nothing illegal. Still, the research team had to undergo a great number of meetings during a year and a half. Consequently, 10 months elapsed between the admission of the possibility to realise this intervention to its implementation, but this was also due to the fact that the intervention was applied to reminders. Civil servants, overburdened with their duties, were apparently reluctant to participate in the research because it meant additional tasks for them. We can observe here the so-called civil servant resistance (Hemmer, 2014; Shah, 2019). The civil servants eventually agreed to participate, but we also encountered resistance when evaluating the results, and the team had to repeatedly ask them to provide data in a format that could be further worked with. Despite the fact that the long communication with the employees did not influence the real implementation of intervention as such, we lost the opportunity to use intervention as a part of regular tax call. It could have offered an interesting comparison of experiment results among tax payers and tax non-payers.
- **The heterogeneity of the groups** was conditioned by the fact that the city of Banská Bystrica decided to combine three types of taxes and fees that were to be the subject of the experiment: real estate tax, dog tax and municipal waste fee. The city divided the research sample of 520 defaulters into 4 groups (1 control, 3 intervention) and although they tried to maintain an approximately equal share of defaulters of each tax and fee, this distribution was no longer even with respect to the amount owed. The types of arrears selected by the city for which it wanted to intervene are diametrically different in terms of the subject of taxation or fee, and the amount of the arrears is also significantly different. According to the data provided, the highest arrears were for the municipal waste tax and the lowest for the dog tax. This fact is supported by the results of the examination of the relationship between the payment of arrears in the second intervention group and the amount of arrears in the second intervention group, where a low to medium level of dependence was confirmed. These differences could then be reflected both in the number of reminders paid and

in the total amount owed, which skewed the results of the nudge. This also limited the experiment based conclusions.

- **Lack of information about the research sample** - in processing the results of the experiment, we encountered the additional limitation of lack of information about the research sample, such as gender, age, length of arrears, regularity of payment of fees, and whether they were in arrears in only one or more areas. If we had these data, it would be possible to better assess whether the individual is a 'habitual defaulter' on whom no intervention is likely to be effective, or just an 'occasional defaulter' who could be nudged to pay the arrears by an intervention. However, these data were not provided by the city, while in Prievidza they helped to reveal other contexts. According to the results of the experiment in Prievidza (Sloboda et al., 2022), the most effective type of reminder for municipal waste fee debtors was Intervention A, i.e. letter + social norm, and they also found that the intervention was more effective on men than on women, but this result is difficult to interpret as it may be related to income inequality or single-parent families with more difficult economic circumstances. The useful feature that should be also researched is the regularity in non-payment of taxes of each subject. On the other hand, the city of Banská Bystrica does not regularly collect such data; it works with different software than the city of Prievidza. Therefore, it would be very complicated and time-consuming for the Economic Department to provide us with additional data on the research sample. The lack of data about the research sample limited the possibilities of statistical evaluations, e.g. regression and correlation analysis.
- **Premature disclosure of information about the experiment** was made by the city. As local elections are approaching, the city leadership used the information about the experiment as an opportunity to promote itself as an innovative smart city that engages in projects and research and uses the latest findings of behavioural economics. By publishing the information before the leaflets were sent out, they were able to influence non-payers in a negative direction in the sense that people do not like to be 'manipulated' (Wilkinson, 2013), i.e. they chose to ignore the invitation with the leaflet and did not pay the tax/fee on purpose.
- **Social status of the tax payers** - single-parent families, households with one or more protected persons, etc.
- **The COVID-19 pandemic** persisting since March 2020 could have a negative impact on the ability of individuals to pay local taxes and fees, regardless of social status as outlined above.
- **Time factor** - the intervention took place in the months October - November 2021 but there are many non-payers who pay their obligations by the end of the year, always in December. This has also been confirmed by the city's Economic Department, which has this experience with chronic non-payers - despite a reminder (sent by the city every year as standard) to pay their taxes and fees by the deadline, they do so basically on 31 December every year.

As in the case of Banská Bystrica, other research points to the possible failure of tax and fee interventions. Research in 2017 showed that messages with social norms or other behavioural nudges work, but cannot be applied everywhere and in every circumstance (Hallsworth et al., 2017; Hernandez et al., 2019). In the case of the Guatemala intervention, there was no increase in tax payments (The Behavioural Insights Team, 2018). Similarly, in Nebraska, an informational nudge was unlikely to be sufficient to substantially change tax filing behaviour (Anderson, 2017). Findings from studies in the United Kingdom suggest that successful interventions at the national level may not necessarily be successful at the local level (Hallsworth et al., 2017; John & Blume, 2017). Therefore, when introducing behavioural interventions, it is essential to consider the particular characteristics of the area where the intervention will be implemented and to identify potential problems with the introduction of the intervention.

Although the experiment in Banská Bystrica did not produce the desired effect in the form of a higher number of paying tax subjects, we can mention other Slovak municipalities (Prievidza, Hlohovec), as well as other examples that we have presented in the theoretical section. among the successful cases that tried to improve tax collection from tax subjects and timely tax payment.

In the case of Banská Bystrica, it is also necessary to consider the possibility of using another form of behavioural intervention, e.g. changing the wording of the notice to the arrears management, simplifying the provision of data on the form of payment when paying via QR codes, send email, etc.

5 Conclusions

The aim of the paper was to analyse an experiment implemented in the area of tax and fee collection in the city of Banská Bystrica with the intention of pointing out the factors behind the fact that the intervention in this case did not turn out as expected. The intervention took the form of distributing variously worded leaflets to citizens assigned to the intervention groups. We expected that the proportion of tax defaulters would decrease as a result of this intervention. Based on the data obtained from the experiment, we found that 188 out of 390, i.e. 48.20%, to whom the intervention leaflet with reminder was sent, paid the arrears. In the control group that did not receive the reminder leaflet, 75 out of 130, i.e. 57.69%, of the arrears were paid. This expectation has not been met and we gave a number in the discussion of reasons why this might be the case. We consider the main reason to be the heterogeneity of the research sample. The fact that the sample included not only tax defaulters, but also defaulters of local dog tax and municipal waste fees, affected whether they paid or not (it makes a difference whether the taxpayer has to pay € 15 for the dog or € 150 for the waste). The most important factor is probably the composition of taxpayers in the intervention and control groups. The research team could not directly influence the composition of the sample, which also proved to be crucial in the evaluation of the implemented experiment. Although random sampling is

considered to be one of the most appropriate from a statistical perspective, its use produced very heterogeneous groups. A more appropriate composition of the groups would have been with debtors with equal proportional representation of each type of tax and fee. At the same time, other data on tax subjects and their behaviour (e.g. gender, age, length of the period for which the arrears are recorded) were absent, which would have made it possible to draw more valuable conclusions from the experiment carried out. On the other hand, it is possible to learn from the implementation of the above experiment and to be inspired when implementing other behavioural interventions, whether in other Slovak or foreign local governments.

In the implementation of experiments aimed at the use of nudges to reduce tax and fee arrears, given that this is a relatively sensitive topic, the willingness of public officials to cooperate and create adequate conditions for its implementation plays a crucial role.

An important factor is also a well-designed methodology for the experiment, which at the same time must always reflect the relevant legislative framework, the specificities of the different levels of government and their competences, and be respected by all the actors involved. The success of an experiment can be influenced by a large number of factors, not all of which can be anticipated in advance and reflected in the methodology of the experiment to be carried out.

Nevertheless, the experience of similar experiments available in the literature and, in part, the results obtained in our research suggest that behavioural interventions aimed at increasing the payment of taxes and fees should be considered as an effective and inexpensive way of reducing the share of non-payers of taxes and fees, not only at the local level but also at the central level.

The presented research has its limitations, in particular the focus of the analysis on only one municipality. The experiment was conducted on a relatively small research sample with considerable heterogeneity. Future research will focus on examining the composition of arrears types in different groups. Nevertheless, several aspects of why the behavioural intervention may fail have emerged, and this may be an issue for further research. Why and when do nudges fail to meet expected outcomes, and what can we learn from such failures?

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