Reducing Property Tax Avoidance Through Information Provision

Thomas Boogaerts[*]

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Abstract

   While recurrent forms of property taxation are hard to evade, avoiding them by appealing the tax base is common practise. These appeals come with a cost for the administration. As a result, there is a strong demand for interventions that reduce the number of unsuccessful appeals. Since successful appeals increase the horizontal equity of the tax base, these should not be affected by the interventions. This paper makes use of a field experiment to investigate if modifying the communication of the property tax base can reduce the number of unsuccessful appeals. The experiment consists out of 4 treatments, a simplification of the letter that informs homeowners about their tax base and 3 different messages that were added to this simplified letter. These messages provided information on the time cost of an appeal or the number of successful appeals in a particular year. While most of the treatments succeed at reducing the number of appeals, they do so by discouraging both successful and unsuccessful appeals. These results indicate that the proposed interventions are not appropriate for the investigated setting, as they reduce the horizontal equity of the tax base.

1   Introduction

International organizations, such as the OECD and the EU, encourage their members to shift the tax burden from labor and property transaction taxes to a recurrent form of property taxation (Gayer and Mourre, 2012; Lindén and Gayer, 2012; Almy, 2014; Brandt, 2014). They argue that this form of taxation leads to less distortions than the alternatives. Moreover, they point out that the property tax is difficult to evade. Since the tax bases of alternative forms of taxation are becoming increasingly mobile, the immovability of properties has become an important advantage of the

property tax. However, this does not mean that the property tax cannot be the subject of tax avoidance. The main method that homeowners can use to avoid property taxation is undermining its tax base. In most countries, the tax base for property taxation is some form of assessed value of the property. Owners of these properties can avoid this tax by filing an appeal against this assessment (Nathan et al., 2021; Jones, 2021; Boogaerts, 2022).

While the property tax' ease of enforcement is an argument in its favor, little is known about the tax avoidance that occurs by means of the appeal behavior. In general, appeals against the assessment of the property tax base are scarcely investigated in the economic literature. Only recently researchers started to investigate it as a source of tax avoidance (Jones, 2021; Boogaerts, 2022) and inequality (Avenancio-León and Howard, 2022). Other papers have shown that the appeal decision is driven by the expected gains from a successful appeal, the filing costs associated with appealing and fairness considerations (Nathan et al., 2021).

Despite its importance for a well-functioning property tax system, the appeal process imposes a large cost on the administration charged with handling the appeals (Doerner and Ihlanfeldt, 2014). Governments allow for appeals because they weigh these costs against the benefits from correcting assessment errors. These benefits are realized through an increase in the horizontal equity of the tax base, meaning that properties with similar characteristics receive a similar assessment. As a results, tax administrations have a strong need for policies that reduce the number of appeals without decreasing the horizontal equity of the tax system. This paper investigates in a field experiment if adjustments to the notification letter, which informs homeowners about the assessment of the tax base of their property, can functions as a policy tool to achieve this goal.

The inspiration for the adjustments comes from the tax compliance literature, which often examines the effect of communication on tax evasion (e.g., De Neve et al.,2021). Although tax compliance is similar to tax avoidance, fundamental differences between the two demand for caution with the implementation of the same interventions. In the tax compliance experiments, the administration seeks to prevent a crime, namely tax evasion. Appealing, however, is seen as a fundamental right of the homeowners. The objective is therefore twofold, namely to reduce the number of unsuccessful appeals without reducing the number of successful appeals. This feature of the setting makes the use of message treatments appropriate, since these treatments do not limit the homeowners' choices. The intervention merely informs homeowners, so they can better make a decision. Another difference can be found in the required action of the recipient of the message. In contrast with the tax compliance setting where the goal is to make the taxpayers pay their taxes, this research tries to increase the fraction of homeowners who do not take action. Providing extra information may therefore be counterproductive if it increases the salience of the option to appeal.

The experiment is conducted in collaboration with the Belgian Federal Tax Administration. For

the experiment I made adjustments to the notification letter that informs homeowners about the assessed tax base for their property tax. In Belgium, there is a recurrent form of property taxation in place that uses as tax base the expected rental value of the property in 1975. As a result, properties are only assessed when they are constructed or after an extension or major renovation. The homeowners are informed of their assessed tax base by means of a notification letter. After they receive this letter, the homeowners have 2 months time to file an appeal. Since most properties have an unchanged tax base since 1975, this appeal decision can lead to long-lasting gains.

The letter that notifies homeowners on the assessed value of their property is modified in four ways. First, following De Neve et al. (2021), the letter is simplified significantly with an increased focus on the characteristics used by the government for the estimation and on sources for additional information on the assessment. This makes it easier for homeowners to observe errors and to inform themselves about the specifics of the estimation procedure. Since the government was unable to send the old letter simultaneously with the simplified letter, the appeal behavior in the preceding year of the intervention is used as control group for the simplification. In three additional treatments, I add a sentence to the simplified letter that provides the homeowners with information about the appeal process. The simplified letter functions as control group for these interventions. Two treatments provide information on the time it takes for an appeal process to be completed. This treatment increases the salience of the time cost of appealing. Following Frey and Meier (2004), I use two periods to compute the average handling time of the appeal, leading to a Short and a Long Time treatment. The last treatment adds a sentence to the simplified letter informing the homeowners on the fraction of homeowners who filed a successful appeal. This treatment, which I refer to as the Success Rate treatment, provides information on the actions of the homeowners' peers as well as information on the probability of success of an appeal.

In the first analysis, I investigate the effect of the treatments on the fraction of homeowners that appeals. Only the Long Time and Success Rate treatment succeed at reducing the appeals. They reduce the fraction of appeals in the control group, 1.9%, with 0.3pp and 0.6pp, respectively. However, a large difference in the reaction to the treatments can be observed based on the type of property. Homeowners of multifamily housing react to a much stronger degree to the information treatments, namely the Short Time, Long Time and Success Rate treatments. For the simplification, I find opposing results for multi and single family housing. While the treatment reduces the appeals for the single family houses, the multifamily houses see an increase in the fraction of appeals. These results could be explained by the higher potential gains in the sample of multi-family housing, as these are more likely to be rented and rents are taxed based on the property tax base. However, a major limitation of this research is the absence of empirical evidence for this explanation.

Although the Long Time and Success Rate treatment consistently reduce the fraction of appeals, this is not sufficient to conclude that these measures are successful policy instruments. The results do not provide any information about which appeals are discouraged by the treatments. To this end, I compare the success rate of the appeals for the different treatments. Since the estimated effects of the treatments are insignificant, the results imply that both successful and unsuccessful appeals are discouraged. However, a significant negative effect of the simplification on the success rate can be observed for the sample of single family houses. This indicates that successful appeals are more discouraged by this treatment. As shown by these results, the treatments that succeed at reducing the number of appeals are doing so by discouraging the successful appeals. Hence, the interventions have a negative effect on the horizontal equity of the tax system.

The analysis of the success rate depends on the proper functioning of the administration. Since we do not know what influences the administration's decision to approve the appeal, I provide an alternative analysis that is independent of the administration's handling of the appeals. This analysis examines to which extent the assessment of the appealed properties are overestimated for the different treatments conditional on the characteristics used for the assessment. I find a significant negative effect for the Short Time and Simplification treatment for the sample of single family dwellings. This indicates that for this sample the more overestimated properties are discouraged by the treatments. The opposite effect is found for the Short and Long time treatments applied to the sample of multifamily dwellings. Since these treatments succeed at reducing the fraction of appeals, this implies that on average the less overestimated appeals are discouraged by these treatments. Based on these mixed results it is difficult to conclude that the benefits of the interventions outweigh its negative effects.

As an extension, I exploit a specific feature of the Belgian tax system, which grants a reduction in the transaction tax to properties with a property tax base below a specific threshold (Boogaerts, 2022). This allows me to investigate whether homeowners react differently in a setting where the appeal process can be strategically used to achieve additional gains. The results show that homeowners' effort to achieve eligibility for the reduction policy is not affected by the treatments.

In general, the findings from this paper show that the interventions are not appropriate to reduce the cost of a well functioning assessment system. While the number of appeals can be reduced by the treatments, there exists a large risk that it negatively affects the horizontal equity of the system. This indicates that policy makers must show caution with the implementation of these type of interventions, as they can be counterproductive and harm individuals' interests.

With these findings I contribute to the small but growing number of papers examining the appeal behavior against property assessments. This literature has shown that the decision to appeal is driven by loss aversion with regards to the previously appraised value (Jones, 2021),

the potential benefits from appealing (Boogaerts, 2022), fairness considerations and the cost of filing an appeal (Nathan et al., 2021). Moreover, research shows that the appeal process is a driver of inequalities in property taxation, as minorities (Avenancio-León and Howard, 2022) and lower income individuals (Doerner and Ihlanfeldt, 2015) are less likely to file an appeal. Mixed findings are reported on the government's handling of the appeals. While Plummer (2014) shows that the administration increases uniformity by granting reductions to over-assessed properties, Weber and McMillen (2010) show that this is less likely in neighborhoods with thin markets. In a related article, Avenancio-León and Howard (2022) conduct a letter experiment in Dallas County, Texas, to reduce the cost of filing an appeal. In two treatments, they send a basic letter with information on how to appeal and an additional aid letter which provides the homeowners with a possible argument for the appeal. These intervention increased the number of appeals with 1.7pp and 3.5pp, respectively. Moreover, they show that this increase did not lead to a decrease in the success rate of the appeals. I contribute to this literature by examining how the communication of the assessed value itself influences the decision to file an appeal.

This study is also related to the large literature on behavioral interventions that aim to increase tax compliance. These interventions mainly focus on increasing the salience of the penalties for evading (Meiselman, 2018; Cranor et al., 2020), imposing a moral cost of evading (Del Carpio, 2013; Meiselman, 2018) and invoking feelings of reciprocity (Castro and Scartascini, 2015; Chirico et al., 2019). A notable example is De Neve et al. (2021), who conduct a nation wide experiment in collaboration with the Belgian Tax Administration. They find that simplifying communication can significantly increase tax compliance. Moreover, they find that deterrence succeeds at increasing tax compliance, whereas messages that emphasise the moral cost of appealing are ineffective. This study contributes to this literature because it is one of the few papers that use behavioral interventions to reduce tax avoidance rather than evasion. While most of the papers in this literature urge taxpayers to undertake action, this paper does the opposite. Since not filing an appeal is the default, this paper tries to make the homeowners stick to that default.

The rest of the paper proceeds as follows, Section 2, describes the institutional background of the experiment. Section 3 presents the experimental set-up. Section 4 discusses the results. The last section concludes.

2 Background

In Belgium, owners of a property must pay an annual property tax. This tax is a combination of three charges levied by the regional, provincial, and local governments.[1] As in most other

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[1]Belgium is a federal state that consists of three regions, namely Flanders, Wallonia and Brussels. These regions have extensive autonomous powers. Flanders and Wallonia are subdivided in 5 provinces. Brussels is not divided into

countries, local governments account for the lion's share of property tax revenues. Approximately 45% of local governments' tax revenues originate from the property tax. Although both residential and commercial properties must pay the property tax, this paper will only focus on residential properties that are owned by households.

The tax base for property taxation in Belgium is the Cadastral Income, CI, which represents the annual rental value of the property at the 1st of January 1975. Initially, the cadastral income was intended to be renewed on a regular basis. However, the assessments have not been updated since 1975. Instead, the administration makes use of a nationwide indexation to update the CI. Although this system of appraisals is clearly outdated, it is not uncommon in Europe to make use of historical values as tax base for the property taxation.[2]

Due to the 1975 tax base, assessments take place only after the construction of a new building or when an existing building is rebuild or extended. After the completion of the construction, the owner is obligated to notify the Federal Tax Administration within 30 days. The administration will then estimate what the rental value of the property is in 1975. It does this based on a limited set of characteristics of the building and the value of the location of the property in 1975. A notification letter is then send to the owner of the property to inform him of the appraised CI. The experimental design of this paper applies adjustments to this letter.

Homeowners can appeal the appraised CI by sending a letter to the tax administration within the first two months following the notification. In this letter, the taxpayer must make a counter proposal for a CI that they believe is more appropriate. The appeal process can consist of three phases, negotiation, mediation and arbitration. In the first stage, the taxpayer can negotiate with an official of the administration and a mutual agreement can be accepted. This part of the process is costly for the administration but the taxpayer can perform this procedure free of charge. If no agreement can be reached then the taxpayer can call upon a fiscal mediation service to reach a settlement. This is an autonomous service that examines the appeal objectively and free of charge. The government bears the costs of this procedure.

When the mediation process fails, the taxpayer and the administration can appoint three referees or instruct a judge of the peace court to appoint them. These referees must then determine the final CI, which is binding. The cost of this procedure is recovered from the party whose initial proposed CI is the furthest from the final CI. For example, an initial CI of 700 EUR is appealed with a counter offer of 600 EUR. If the referees would decide on a CI of 675 EUR, then this CI differs most from the homeowners' proposal. As a result, the homeowner who filed the appeal must pay the costs of the referees. This cost amounts to a minimum of 75 EUR and a maximum

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provinces. Belgium consists out of 581 municipalities.

[2]In Europe a number of property assessment systems make use of outdated assessments (Austria 1973, Cyprus 1980, UK 1991, Germany 1964).

1000 EUR, calculated as a percentage of the CI. This standard cost is increased with the wages of the referees, which are 60% of the previous calculated cost per referee. According to these calculations, the total maximal cost of an appeal can amount to 2800 EUR and minimal to 210 EUR. However, it is very rare for an appeal procedure to result in arbitration.

In the appendix, I present some examples of appeals provided by the administration. The argumentation used in the appeals is not included in the data sets of the government. The examples, however, give some insight in the arguments that homeowners put forward for a reduction. The first two examples, show homeowners who observed an error in the characteristics used by the administration for the estimation. The other examples, include homeowners who argue that their CI should be reduced due to location specific characteristics, such as the presence of a prison or a large road. However, it is unlikely that the assessors are unaware of these characteristics of the locations.

3   Experimental Design

Appeals filed against the CI can lead to a substantial cost for the administration. For this reason, the administration has an incentive to lower the number of appeals from a purely cost minimizing perspective. However, appeals are a fundamental part of a property assessment system. When done properly, it can lead to an increase in the horizontal equity of the tax base, meaning that houses with similar characteristics receive similar assessments. For this reason the purpose of the experiment is twofold. The experiment seeks to reduce the unsuccessful appeals, while increasing the successful appeals or at least not reduce them.[3] By means of a field experiment, I investigate if behavioral interventions are a useful tool to achieve the administrations' goals. More so, reducing the unsuccessful and increasing the successful appeals is in the best interest of the homeowners. Homeowners who file an unsuccessful appeal lost valuable time on the appeal procedure. If the interventions would have prevented these homeowners to file an appeal, then they gain from this intervention.

In collaboration with the Belgian Tax Administration, I apply changes to the notification letter that is send to newly assessed properties. As this letter has to be send anyway, this intervention is cost neutral. If anything the changes applied lowered the printing and mailing costs, as the length of the letter is significantly reduced. The right to appeal is fundamental for a well functioning tax system, as such information treatments are a logical tool to improve the appeal procedure. These sort of treatments do not restrict the individuals choices, they only offer information that allows the individual to better make a decision.

[3]This is conditional on the well functioning of the administration. If the administration grants reductions to properties that are not assessed to high, then the success of the appeal will not be the right outcome to examine.

The first treatment significantly simplified the notification letter. In three additional message treatments, a sentence with specific information on the appeal process was added to the simplified letter. These four different letters were randomly send to all homeowners whose CI had to be assessed between September 2020 and 2021. The randomisation was done based on the last two digits of the national identity number, which are random.[4] In total 82,192 properties were part of the experiment.

To better understand through which mechanisms these interventions affect the decision to file an appeal, I first formalize this behavior in equation 1. Homeowners file an appeal when the gains from doing so, G, outweigh the cost of the effort to file the appeal, C^e, and the societal cost, C^s. The latter represents the potential costs of guilt if the homeowners files an unjustified appeal or the costs to the government of processing the appeal. I assume that unsuccessful appeals result from misconceptions about one of these three variables. By providing information through the four interventions, I try to reduce the homeowners' misconceptions in the decision making process.

$$P(a) = P(G - C^e - C^s > 0) \tag{1}$$

Simplification: A possible reason why homeowners may file an appeal, even when the actual probability of success is relatively low, is when they overestimate the potential gains from such an appeal, G in equation 1. These potential gains are a combination of perceived probability of success and what homeowners perceive as the appropriate CI for their property. In this treatment the original letter is significantly simplified in the spirit of De Neve et al. (2021) to reduce the misconceptions about these potential gains. This simplification included three main changes. First, the new appraised CI was highlighted in a colored box to increase transparency. While in the old letter, the taxpayers had to look for the appraised CI in a table with the administrative cadastral information, such as the location and the cadastral identifier number. Second, the characteristics used for the appraisal are explicitly put forward in a large box on the front page of the letter. While in the old letter, the characteristics where communicated by means of an encoding. The meaning had to be looked up in the attachment. This change helps the homeowners to notice errors in the used data. Third, additional sources where the homeowners can find information on the estimation procedure as well as the appeal procedure were added and presented more clearly. This makes it easier for the homeowners to gather information which allows them to make a better informed decision to appeal. Additionally, minor changes were made to the introductory text of the letter. These changes put a larger emphasis on the fact that the estimation is based on the value of the characteristics of their plot and location in 1975. Which makes it clear to the homeowners that this does not represent the present rental value of the property. Both the old

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[4]De Neve et al (2021) make use of a similar approach to randomize their treatments

and simplified letters are presented in Figures 6 to 9 in the appendix.

Short and Long Time: Besides the gains, misconceptions about the costs associated with appealing might lead to unwanted appeals as well. Homeowners who know that the potential gains from appealing are relatively low, may still file an appeal if they believe that the costs associated with it are negligible. In these time treatments a sentence is added to the simplified letter that informs the homeowners on the average time it takes for an appeal to be settled. This way, homeowners can better weigh the time cost, C^e, and hassle involved in the appeal process against the potential benefits. Additionally, this treatment provides information on the societal costs of an appeal, C^s, namely the time spent by the administration on the appeal. Homeowners who file an opportunistic appeal could ignore this cost.[5] This treatment allows them to incorporate this societal cost in their decision making. Increasing the salience of the time cost of an appeal is similar to the deterrence treatments in a tax compliance setting where the salience of the possible costs of evasion is being increased. Following Frey and Meier (2004), we make use of two different time frames to calculate the average time it takes for an appeal to be settled. In the Short Time treatment the average is calculated based on appeals filed in 2017, which amounted to 82 days, while in the Long Time treatment the average is calculated based on all the appeals filed between 2007 and 2018, which amounted to 134 days. The difference between these two averages is a result of the truncated data set of the 2017 sample. This variation allows us to disentangle the effect of the content in the added sentence from that of the salience it puts on the option to appeal. If homeowners responds to the same degree to the Long and Short Time treatment, then this is likely the result of making the appeal process more salient. However, if homeowners are more likely to file an appeal when they received the Short Time treatment than the Long Time treatment, then this shows that homeowners are updating their expectations based on the provided information. Figure 10 shows the location of the sentence on the notification letter. The following sentence is added in the Short Time treatment: "Attention! The average time for handling an appeal was 82 days in 2017." The following sentence is added in the Long Time treatment: "Attention! The average time for handling an appeal is 134 days."

Success Rate: In this treatment we add a sentence to the simplified letter that informs the recipient on the fraction of homeowners that filed a successful appeal in 2017. This implicitly informs the homeowners on both the success rate of an appeal and the number of appeals that are filed. As a result, this intervention tries to reduce misconceptions about both the potential gains, G, and the societal costs, C^s, of an appeal. Informing the homeowners on the success rate can be compared to the treatments used in the tax compliance literature that inform taxpayers on the probability of an audit. Besides, the message provides a form of peer pressure as the homeowners

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[5]On internet fora homeowners are advised to appeal since their is nothing to loose. This is merely anecdotal evidence that "opportunistic appeals" can occur.

are informed that only a small group of their peers file an appeal. This approach is commonly used in the tax compliance setting when they inform taxpayers on the number of citizens that pay their taxes on time. The fraction of successful appeals over all assessed properties is preferred over the ratio of the filed appeals that were successful. The latter entails a selection effect that results in an upward bias compared to the actual average probability of a successful appeal of the entire population. As a result, the administration feared an increase in the number of unsuccessful appeals and was reluctant to make use of this alternative ratio. The following sentence is added in this treatment: "Attention! Only 2.98% of the homes notified in 2017 were successfully appealed." By including the word only, we frame the number of appeals as small. We do so to discourage homeowners of filing an appeal that is unlikely to be successful. However, this can backfire if homeowners who would normally file a successful appeal are discouraged to do so.

To estimate the causal effect of the Short time, Long time and Success rate treatments, I compare the appeal behavior of the homeowners who received one of these treatment with those homeowners who received the simplified letter. In other words, the simplified letter functions as control group for the message treatments. The administration was unable to send the old complex letter within the period that the experiment was conducted. Therefore, as a second best approach, the homeowners who received the old letter in the year preceding the experiment are used as control group to estimate the effect of the simplification itself. The results from the simplification treatment must therefore be interpreted with caution as they could be driven by unobserved variation.

In Table 1, I report the means of the main characteristics used by the administration to estimate the CI for each group. The randomisation for the message treatments is based on a completely random number, namely the national identity number. Nevertheless, certain significant differences between the means of the message treatments and the simplification can be observed for the assessed CI and the useful surface of the parcel. Both the homeowners of single family dwellings who received the Short Time treatment or the Success Rate treatment have on average a lower CI than the control group, the simplification treatment. This is also the case for homeowners of multifamily dwellings who received the Short Time treatment. The average useful surface of the recipients of the Short and the Long Time Treatment is on average 1 to $3m^2$ larger than that of the control group for the sample of multifamily housing. Additionally, I compare the means of the characteristics of the recipients of the Simplification treatment with those who received the Old Letter in the year preceding the experiment. Large differences in the characteristics of both groups can be observed. To overcome possible concern arising from these differences, I provide estimates conditional on these characteristics in the results section.

Table 1. Summary Statistics by Treatment Group

	Old Letter	Simplification		Short time		Long time		Success Rate	
	Mean	Mean	Diff. with CG	Mean	Diff with CG	Mean	Diff with CG	Mean	Diff with CG
Single-Family									
CI	1,017.07	1,017.48	-0.40	1,033.63	-16.15**	1,017.35	0.13	1032.68	-15.20**
Plot Surface	785.02	748.88	36.14***	763.47	-14.59	757.08	-8.20	752.60	-3.71
Useful Surface	217.40	204.51	12.89	204.07	0.44	217.43	-12.92	203.19	1.32
Renovation Dummy	0.63	0.66	-0.04***	0.66	0.00	0.67	-0.01	0.66	0.00
Bathrooms	1.24	1.27	-0.03***	1.27	-0.00	1.26	0.01	1.28	-0.01
Useful Chambers	5.71	5.63	0.08*	5.62	0.01	5.68	-0.04	5.66	-0.02
Observations	54,637	21,875		10,985		11,293		10,020	
Multi-Family									
CI	870.25	854.98	15.27***	859.21	-4.23	864.08	-9.10	866.98	-12.00*
Useful Surface	96.46	97.85	-1.39	100.91	-3.06**	99.70	-1.54**	98.75	-0.90
Renovation Dummy	0.32	0.36	-0.04***	0.38	-0.02**	0.34	0.018**	0.37	-0.01
Bathrooms	1.09	1.13	-0.04**	1.10	0.03	1.10	0.03	1.10	0.03
Useful Chambers	3.27	3.30	-0.03	3.34	-0.04*	3.31	-0.01	3.31	-0.01
Observations	65,293	11,257		5,826		5,593		5,343	

Note: This table presents the mean values for the four treatments and the properties that received the Old Letter in the year preceding the experiment. The difference in the mean with the respective control group for each treatment are reported. The control group for the Simplification is the Old Letter, while the control group for the Short Time, Long Time and Success Rate is the Simplification. The significance of the t-test for the differences are depicted by *** p<0.01, ** p<0.05, * p<0.10.

3.1 Ethical considerations

In the tax compliance literature, on which this paper draws heavily, the behavior that is being discouraged is a crime. In this setting, however, the interventions seek to discourage an act which is considered a fundamental right of taxpayers, namely appealing. This may raise concerns about whether these interventions harm participants (Ifcher and Zarghamee, 2016). Thaler (2018), argues that behavioral intervention, such as those examined in this paper, should only be used to help individuals make better choices as judged by themselves.

The specific interventions chosen in this study do address these concerns for three reasons. First, the interventions merely provide information or simplify the information provided. Therefore, the interventions enable individuals to better make a decision without actively limiting the choice to appeal or creating additional barriers. Second, the aim of the study is not to reduce the number of appeals, but only to reduce those that are unsuccessful. It is in the interest of individuals who, because of misconceptions about the benefits or costs of an appeal, have filed an unsuccessful

appeal to be provided with information that may deter them from making that choice. Third, it is in the interest of taxpayers that the taxes they pay are used efficiently. Consequently, unsuccessful appeals result in a cost to every taxpayer.

4 Results

4.1 Number of Appeals

From a cost minimizing perspective the government has an incentive to reduce the number of appeals. In this section, I investigate how the number of appeals is affected by the treatments. To this end, I use the linear model specified in equation 2. Since the treatments are randomly divided over the properties, a comparison of the fractions of appeals would be sufficient. However, I also report the estimates conditional on the characteristics used by the administration to estimate the CI, since significant differences between the groups do occur.

$$Appeal_i = \beta_1 \times Short\_Time_i + \beta_2 \times Long\_Time_i + \beta_3 \times Success\_Rate_i + \lambda' X_i + \epsilon_i \qquad (2)$$

The dependent variable in equation 2 is a dummy that indicates whether the assessment for property i has been appealed. In the regression, dummies are included that indicate if the homeowner was treated with the Short Time, Long Time or Success Rate treatment. X_i represents a vector with the characteristics of the property. This model is estimated based on all the homeowners who received the Short Time, Long Time, Success Rate and Simplification treatment, with the latter acting as a control group. To estimate the effect of the Simplification, a similar model is estimated based on the homes assessed in the year preceding the experiment and those that received the Simplified treatment during the experiment. Unlike equation 2, this model only includes one dummy that indicates whether the property received the Simplification treatment.

Table 2, presents the estimates for the message treatments and the Simplification treatment in panels A and B, respectively. The odd columns report the estimates for the specifications that control for the characteristics of the building. However, there are no differences between the estimates of both specifications. The first two columns show the results for the full sample. The estimates for all treatments are negative, but only the Long Time and Success Rate treatment are significantly different from zero. These treatments reduce the fraction of appeals with 0.3pp and 0.6pp, respectively, from a baseline of 1.9% in the control group. The effect of the Long Time treatment indicates that homeowners on average underestimate the time it takes to handle an appeal. Taking into account the difference between the Short and Long Time treatment, we can conclude that this result is driven by the content of the message and not the increased salience of

the appeal procedure.

The largest effect can be observed for the Success Rate treatment. This treatment informs homeowners about the fraction of properties that are successfully appealed in 2017. I see two possible explanations for this result. First, homeowners overestimate the number of homeowners who appeal. They update their beliefs with the information provided and are less likely to appeal as they feel pressure to follow the majority. Second, homeowners overestimate the probability of a successful appeal. The information in the treatments lowers the expected gains of the homeowners if they appeal. As a result, on average, homeowners become less likely to file an appeal. However, the experimental design does not allow to disentangle which of these two explanations is driving the result.

The Simplification does not have a significant effect on the fraction of appeals. However, this does not mean that the Simplification had no effect. It can still be the case that treatment increases the number of successful and reduces the number of unsuccessful appeals. The non significant result for the Short Time treatment could be the result of a similar effect.

In the 3rd and 4th columns, I present the results for the sample of single family housing. The 5th and 6th column show the results for multifamily houses. The results show large differences between the estimates for both groups. Homeowners of multifamily housing are reacting to a much stronger degree to the information messages than those of the single family houses. For the latter no significant effect can be observed for the Short and Long Time treatment. The effect of the Long Time treatment for the full sample is entirely driven by the strong reaction of the owners of multifamily housing. Only the Success Rate has a significant negative effect for both groups.

The null result of the Simplification for the full sample, hides opposite effects for the single and multifamily dwellings. The simplification leads to a significant reduction in the fraction of appeals for the first, while it increases the number of appeals for the latter. The treatments emphasise which characteristics the homeowners needs to compare with the other dwellings to evaluate the accuracy of the assessment. Since it will be easier to find comparable properties for the sample of multifamily housing, their probability of appealing increases. The opposite effect can be observed for single family dwellings because these are more heterogeneous.

A shortcoming of this research is the absence of information about the owners of the property besides that they are households.[6] Therefore, I am unable to explore whether the differential effect between single and multifamily dwellings is caused by different characteristics of the homeowners. An alternative explanation is the fraction of homeowners who rent out their property. In Belgium, owners of multifamily housing are more likely to put their property up for rent than those of single family housing. Since rental income is taxed based on the CI, the gains from a

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[6]The administration makes use of the notion of "natural person", meaning not a organisation or corporation.

Table 2. Effect of the Treatment on the Fraction of Appeals

	Full Sample		Single Family		Multifamily	
	(1)	(2)	(3)	(4)	(5)	(6)
A. Messages						
Short Time	-0.001	-0.001	0.000	0.000	-0.004*	-0.004*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Long Time	-0.003**	-0.003**	-0.000	-0.000	-0.008***	-0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Success Rate	-0.006***	-0.006***	-0.004***	-0.004***	-0.010***	-0.010***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Building Char.		X		X		X
Observations	82,192	82,105	54,173	54,129	28,019	27,976
R-squared	0.000	0.004	0.000	0.005	0.001	0.004
B. Simplification						
Simplification	-0.000	-0.001	-0.003**	-0.003**	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Building Char.		X		X		X
Observations	153,062	152,453	76,512	76,376	76,550	76,077
R-squared	0.000	0.004	0.000	0.007	0.000	0.003

Note: This table presents the estimates from the LPM described by equation 2. The dependent variable is a dummy indicating if the assessment was appealed. Panel A describes the results of the information treatments, using the simplified letter as control group. Panel B describes the results of the simplification, using the old letter as control group. Every even column represents the estimates when controlled for building characteristics. In the 3rd and 4th column, results for the sample of single-family houses are reported. In the 5th and 6th column, the results for the sample of multi-family houses are reported. Robust standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

reduction in their CI leads to both a reduced property tax and a reduction in the taxes owed on their rental incomes. The higher possible gains from the appeal could lead to increased attention on their notification letter. Which in turn can result in a higher probability of incorporating the information provided in the message treatments and the Simplification. Nevertheless, further exploration of this difference is beyond the scope of this research due to data limitations.

4.2 Horizontal Equity

The goal of the experiment is minimizing the number of appeals without reducing the horizontal equity. In other words, reducing the unsuccessful appeals without affecting the successful appeals. To this end, this section investigates if the success rate of the appeals increases as a result of the different treatments. However, research has shown that the appeal procedure does not have to lead to an increase in the horizontal equity (Weber and McMillen, 2010; Plummer, 2014). The administration could grant reductions to properties which do not have an over-assessed CI in comparison with similar properties. To address this concern, I present an additional analysis in which I estimate how the degree of overestimation of the appealed properties varies across the different treatments. If the appeals that are discouraged by the treatments are those of properties that are not over-assessed, then the treatments have the potential to reduce the number of appeals without reducing the horizontal equity.

4.2.1 Probability of Success

Table 3 presents the estimates for a similar linear probability model as that described by equation 2. However, in this specification the dependent variable is replaced with a dummy that indicates if the appeal is successful. This model is then estimated based on the properties that filed an appeal. The parameters, β_1, β_2 and β_3, correspond with the difference in the success rate of the appeals caused by the treatment in comparison with the control group. A positive effect indicates that more successful or less unsuccessful appeals are filed against properties that received the particular treatment instead of the control. Again, the results in the odd columns represent the estimates for the specifications in which I control for the characteristics of the building.

The first two columns present the results for the full sample. The parameters for all treatments besides the Long Time treatment are negative. These estimates, however, are not statistically significant. This means that for these treatments both successful and unsuccessful appeals are affected in the same way. The previous section showed that due to the the Long Time and Success Rate treatment fewer appeals were filed. In combination with the insignificant effect on the success rate, this means that both treatments discouraged successful as well as unsuccessful appeals.

Table 3. Effect of the Treatments on the Probability of Success

	Full Sample		Single Family		Multifamily	
	(1)	(2)	(3)	(4)	(5)	(6)
A. Messages						
Short Time	-0.021	-0.027	-0.017	-0.013	-0.031	-0.037
	(0.035)	(0.034)	(0.045)	(0.044)	(0.055)	(0.055)
Long Time	0.030	0.025	0.044	0.042	-0.012	-0.004
	(0.036)	(0.036)	(0.044)	(0.044)	(0.061)	(0.061)
Success Rate	-0.035	-0.042	-0.026	-0.034	-0.056	-0.060
	(0.041)	(0.041)	(0.052)	(0.052)	(0.066)	(0.063)
Building Char.		X		X		X
Observations	1,397	1,395	848	847	549	548
R-squared	0.002	0.030	0.002	0.044	0.002	0.057
B. Simplification						
Simplification	-0.015	-0.026	-0.059**	-0.054*	0.012	-0.003
	(0.022)	(0.022)	(0.030)	(0.030)	(0.033)	(0.034)
Building Char.		X		X		X
Observations	2,925	2,920	1,394	1,393	1,531	1,527
R-squared	0.000	0.033	0.003	0.033	0.000	0.029

Note: This table presents the estimates from the LPM described by equation 2 with the dependent variable replaced by a dummy indicating if the appeal was successful. Panel A describes the results of the information treatments, using the simplified letter as control group. Panel B describes the results of the simplification, using the old letter as control group. Every even column represents the estimates when controlled for building characteristics. In the 3rd and 4th column, results for the sample of single-family houses are reported. In the 5th and 6th column, the results for the sample of multi-family houses are reported. Robust standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

In the remaining columns, the estimates for the sample of single and multifamily housing are reported separately. No significant results can be observed for the message treatments in Panel A. The parameters, however, are smaller for the sample of multifamily housing. In Panel B, only the estimates for the sample of single family housing is significant. Simplifying the letter thus leads to a decrease in the probability of a successful appeal of 5pp for the single family houses from a baseline success rate of 64%. As the estimates in the previous section showed that this treatment reduces the number of appeals, then this means that especially successful appeals have

been discouraged.

In general, the estimates show that the interventions do not lead to an increase in the success rate for those treatments that succeed at reducing the appeals. If anything it leads to a reduction in the number of successful appeals. Under the condition that the administration only reduces the appeals of overestimated CI's, this means that the interventions decrease the horizontal equity of the tax.

4.2.2 Hedonic Model

In this section, I provide evidence on the interventions' potential to increase the horizontal equity of the tax base. To make a distinction of the administration's ability to handle the appeals, it is useful to investigate if the appealed properties have on average a higher CI compared to similar buildings. To this end, I construct a hedonic model to estimate the CI based on the property's characteristics and its location. This approach mimics the assessment procedure of the administration. Equation 3 describes the outline of the hedonic model used for this analysis.

$$
\begin{aligned}
CI_i = \beta_1 \times Appeal_i &+ \beta_2 \times Control\_Group_i + \beta_3 \times Short\_Time_i + \beta_4 \times Long\_Time_i \\
&+ \beta_5 \times Success\_Rate_i + \beta_6 \times Appeal_i \times Short\_Time_i + \beta_7 \times Appeal_i \times Long\_Time_i \\
&+ \beta_8 \times Appeal_i \times Success\_Rate_i + \lambda' X_i + \alpha_j + \epsilon_i
\end{aligned}
\tag{3}
$$

The goal of the model is to estimate the CI, as such the CI of property i functions as the dependent variable. In an additional specification, I run the model with the logarithm of the CI as dependent variable, which results in a better fit. Included in the model are the same characteristics that are used by the government during the assessment. These characteristics, such as the surface, number of bathrooms, construction year, are included in the vector X_i. The model adds fixed effects on the same geographical level that is used for the assessment of the CI, called the cadastral division. α_j, depicts the fixed effects of cadastral division j.

Dummies indicating which treatment the property received and a dummy that indicates if an appeal was filed for the property are added to the model. Furthermore, interaction terms between the appeal and treatment dummies are included. The parameter associated with the appeal dummy, β_1, captures the CI's overestimation for appealed properties in the control group, in this case those who received the Simplification treatment, in comparison to similar properties who did not file an appeal. The effect between the treatments and the overestimation of the appealed building is captured by the parameters associated with the interaction terms. In other words, if these parameters are positive, than the homeowners who decide to file an appeal have on

average a higher overestimated CI compared to similar homes. Which indicates that the treatments increased the probability of filing an appeal for homeowners who have an overestimated CI. This can enable the administration to improve the horizontal equity of the tax base. To estimate the effect of the Simplification itself, the model is adapted such that the old letter functions as the control group and the Simplification as the only treatment.

I extend the experimental data with all the properties in Belgium in 2021 to better estimate the parameters associated with the building characteristics and the fixed effects in the model. Since some characteristics are not applicable to apartments, two different models are used to separate the effect for the single and multifamily dwellings. The estimates of these hedonic models can be retrieved in table 4.

Table 4. Hedonic Model to Capture the Overestimation of the CI

	Single Family		Multifamily	
	CI	ln(CI)	CI	ln(CI)
	(1)	(2)	(3)	(4)
A. Messages				
Short Time × Appeal	-38.356	-0.046**	60.525	0.065**
	(38.410)	(0.023)	(42.403)	(0.032)
Long Time × Appeal	4.388	0.002	67.299*	0.070*
	(38.234)	(0.023)	(37.785)	(0.036)
Success Rate × Appeal	38.362	-0.016	-3.200	0.056
	(48.193)	(0.026)	(38.001)	(0.038)
Observations	2,612,590	2,612,590	1,081,202	1,081,202
R-squared	0.735	0.812	0.558	0.562
B. Simplification				
Simplification	-44.139*	-0.015	-17.840	-0.018
	(26.227)	(0.016)	(19.555)	(0.019)
Observations	2,634,899	2,634,899	1,129,531	1,129,531
R-squared	0.735	0.811	0.558	0.561

Note: This table presents the estimates from the hedonic model described by equation 3. The dependent variable is the CI in the even columns and the logarithm of the CI in the odd columns. Panel A describes the results of the information treatments, using the simplified letter as control group. Panel B describes the results of the simplification, using the old letter as control group. The first two columns describe the results for the sample of single-family houses. The last two columns describe the the results for the sample of multi-family housing. Robust standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

The first two columns show the estimates for the parameters of the interaction terms for the sample of single family housing. I only find a significant negative effect for the Short Time treatment for both the specification with the CI and the logarithm of the CI as dependent variable. The properties that file an appeal in the control group, those who receive the Simplification Treatment, have a CI that is on average 85 EUR larger than similar dwellings. The results show that this overestimation is 38 EUR lower for the group of homeowners who received the Short Time treatment. Since the Short Time treatment did not reduce the number of appeals, this means that the treatment caused a shift in the composition of homeowners who appealed. Due to the treatment homeowners with less overestimated properties became more likely to file an appeal than homeowners with more overestimated properties.

I find a similar effect for the Simplification treatment. Homeowners who received the simplified letter and filed an appeal have on average a CI which is 44 EUR lower than the homeowners that filed an appeal and received the Old Letter. In contrast to the Short Time treatment the Simplification treatment did reduce the number of appeals. These results therefore indicate that the discouraged appeals are on average overestimated.

For the sample of multifamily houses, the Long Time treatment results in a significant change. Properties that received this treatment and filed an appeal had on average an assessed CI which was 67 EUR higher than for the appealed properties in the control group for which the over-assessment amounts to 38 EUR. While the effect of the Short Time treatment is insignificant in the first specification, it is significantly positive in the specification which uses the logarithm of the CI as dependent variable. Since both treatments succeed at reducing the appeals, this indicates that they do so by discouraging the appeals against less overestimated assessments.

Furthermore, it is important to note that no significant result can be observed for the Success Rate treatment. Since this treatment succeeds at reducing the number of appeals, these results suggest that it does so by discouraging both the more and less over-estimated properties.

The results presented in this section are mixed. While for the single family sample none of the treatments improved horizontal equity and some even decreased it by discouraging over-estimated properties to appeal, for the multifamily sample both the Short and Long Time treatment appear to discourage the less overestimated properties from appealing. These results must be handled with care as they do not align with the findings from the analysis of the probability of success. This could indicate that if the administration does a good job at handling these appeals, that the hedonic model used in this section is missing out on some characteristics which would explain the over-estimation. Regardless, no treatment applied to the full sample succeeds at reducing the number of unsuccessful appeals without reducing the number of successful appeals.

4.3 Effect on reduction threshold

An interesting feature of the CI is that it functions as an eligibility requirement for two reduction policies. First, properties that are used as the main residence of the owner receive a reduction of 25% in their property tax if their CI is below 745 EUR. Second, the transaction tax that buyers of a property in the Walloon Region have to pay is reduced for properties with a CI of less than 745 EUR. Research by Boogaerts (2022) shows that the homeowners only react to the transaction tax reduction. Since homeowners who have received an assessed CI above the threshold have larger potential gains from filing an appeal, it is interesting to see how these homeowners change their behavior as a result of the interventions. For this analysis, I focus on the assessed properties in Wallonia around the 745 EUR threshold. I use two types of analyses to explore the changes in behavior caused by the treatments at the threshold. First, I use a regression discontinuity approach to estimate the discontinuity in the probability of filing an appeal at the threshold for each treatment. By comparing these discontinuities, I can observe if the treatments on average caused a change in appeal behavior for these homeowners with higher expected gains. Second, I investigate if homeowners are more likely to propose a counter CI below the threshold as a result of the treatments. Following the method described by Calonico et al. (2014), I estimate the discontinuity at the threshold. The idea behind this approach is that without the reduction policy at the threshold, homeowners with an assessed CI just above and below the threshold would, on average, have an equal probability of filing an appeal. Conditional on a smooth distribution of confounding variables at the threshold, the discontinuity in the probability of appealing represents the causal effect of the threshold. Figure 1 shows the RD-estimates with the corresponding 95%-confidence interval for each treatment.

To interpret the effect of the message treatments the Simplification is used as a control group. Based on these estimates, no significant effect of the treatments on the reaction to the threshold can be observed. The discontinuity for the Long Time treatment is slightly lower than for the simplification leading to an insignificant RD-estimate, but the difference with the control group is insignificant. These results indicate that in contrast to the full sample, homeowners who file an appeal that seeks to achieve eligibility for the reduction policies are unaffected by the treatments. A possible reason can be that they perceive their appeal as different from the average appeal for which the information is being provided. Boogaerts (2022) finds that these homeowners demand on average smaller reductions, therefore they may think that their appeal has a higher success rate and will take less time to complete in comparison with the average appeal.

The previous results show that the number of appeals did not change at the threshold, however the appeal behavior itself can change due to the treatment. To this end, I investigate how the proposed counter value of properties with an assessed CI above the threshold changes due to the

Figure 1. Estimates of the Regression Discontinuity by Treatment Group
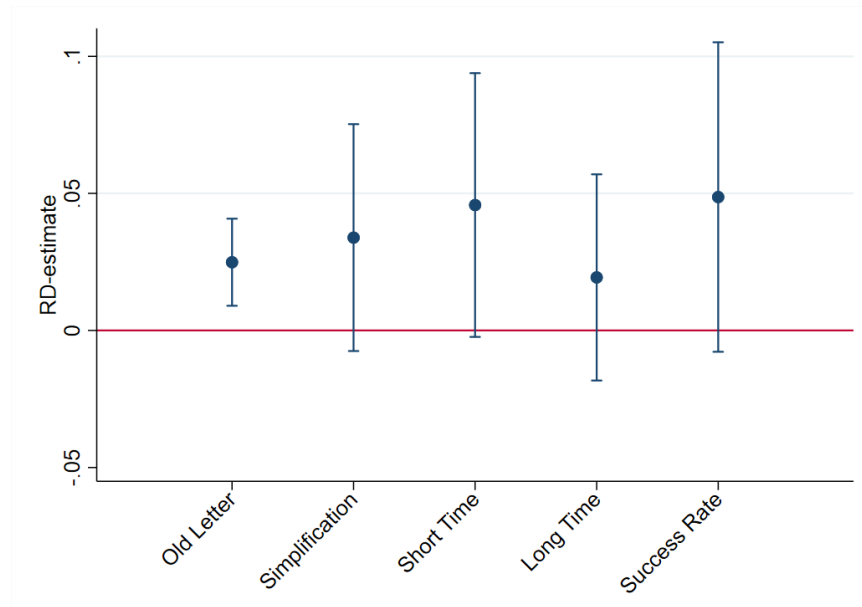
treatments. To do so, a LPM is estimated with as dependent variable a dummy indicating if the counter value is below the threshold. The model controls for building characteristics and includes dummies that indicate which treatment the property received. The parameters associated with these dummies represent the effect of the treatment on the probability of proposing a counter value below the threshold.

The results in Table 5 show the estimates for three different specifications of the LPM conditional on the dependent variable that is being used. In the first column, the dependent variable takes the value one if the proposed counter value of the homeowners is below the threshold. In the second column, the variable takes the value one if the counter value is exactly equal to the threshold. In the last column, the variable takes the value one if the counter value is within a range of 10 EUR below the threshold. In line with the RD-estimates, no significant result can be observed for the treatments. This indicates that none of the aspects of the appeal behavior, meaning the decision to appeal and which counter value to propose, are affected by the treatments.

To conclude, in this section I investigated if homeowners react differently when the stakes are higher as they can achieve eligibility for a reduction policy. In contrast to the full sample, the treatments did not have any significant effect on the interaction between the appeal behavior and the reduction threshold.

Table 5. Probability of Counter Value Below the Threshold

	Prob($Counter < 746$**)**	**Prob(**$Counter = 745$**)**	**Prob(**$735 < Counter < 746$**)**
	(1)	(2)	(3)
A. Messages			
Short Time	-0.013	0.013	-0.004
	(0.055)	(0.020)	(0.031)
Long Time	-0.065	0.030	0.030
	(0.057)	(0.024)	(0.037)
Success Rate	0.057	0.036	0.041
	(0.062)	(0.028)	(0.039)
Observations	391	391	391
R-squared	0.270	0.025	0.050
B. Simplification			
Simplification	-0.009	-0.006	0.009
	(0.038)	(0.011)	(0.021)
Observations	779	779	779
R-squared	0.219	0.009	0.029

Note: This table shows the estimates from a LPM model with as dependent variable a dummy that indicates if the proposed counter value in the appeal is equal to 745, below 746 or between 735 and 746. The estimates represent the effect of the treatment on the probability that the homeowners propose a counter value below the threshold. Robust standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

5   Conclusion

In this paper, I describe the results from an experiment conducted in collaboration with the Belgian Federal Tax Administration from September 2020 to 2021. The experiment adjusts the notification letter that informs homeowners about the appraisal of their property tax base. Homeowners can oppose this assessment by filing an appeal. From a cost minimizing perspective, the government has an incentive to reduce the number of appeals. However, the appeal procedure is necessary to increase the horizontal equity of the tax base. Therefore, the experiment seeks to reduce the number of unsuccessful appeals, while keeping the number of successful appeals constant or even increase them.

To this end, four different notification letters were send to the homeowners. The first treatment entailed a significant Simplification of the notification letter. The second treatment is the Short Time treatment, which informs homeowners that in 2017 it took on average 82 days to complete the

appeal process. The third treatment is the Long Time treatment, which informs the homeowners that on average it takes 132 days to complete the appeal process. The fourth treatment is the Success Rate treatment, which informs the homeowners that in 2017 2.98% of the homeowners filed a successful appeal.

On average the Long Time and Success Rate treatment reduced the fraction of appealed properties with 0.3pp and 0.6pp, respectively, from a base line of 1.9%. For the Simplification and the Short Time treatment no significant results can be observed. However, behind these results is a difference between the single family and multifamily dwellings. Homeowners of the latter react to a much stronger degree to the extra information provided in the Short Time, Long Time and Success Rate treatments. I argue that this can be explained by larger possible gains for multifamily housing, which can result in homeowners who pay more attention to the treatments. For the Simplification treatment a reduction in the appeals can be observed for the single family dwellings, while it results in an increase in the fraction of appeals for the multifamily housing. A possible explanation can be found in the higher degree of heterogeneity in the sample of multifamily housing, which makes it easier to find comparable properties to evaluate the assessment.

While a reduction in the number of appeals is beneficial from a cost minimizing perspective, it is not desirable if it leads to a reduction in the horizontal equity of the tax base. To address this, I explore which homeowners are discouraged by the treatments. The findings show that for most treatments there is no change in the probability of success for the appeals. Meaning, that both successful and unsuccessful appeals are being discouraged by the treatments. We only see a reduction in the probability of success due to the Simplification treatment for the sample of single family housing. Showing that the treatments results in the discouraging of appeals that would be successful. This approach, however, depends on how well the administration is handling appeals. Therefore, I use an hedonic model to explore how much the appealed properties are overestimated compared to similar properties that were not appealed and how this differs over the treatments. Again, I find a difference between the estimates for the sample of single- and multifamily housing. The overestimation of appealed single family dwellings for both the Short Time treatments and the Simplification is significantly lower than the respective control groups. For the multifamily dwellings an opposite effect is found for the Short and Long Time treatment, indicating that these succeed at discouraging the less overestimated properties from appealing. In an extension, I investigate if homeowners who can achieve eligibility for a reduction policy react differently to the treatments. These homeowners have higher potential gains from reducing their CI below a certain threshold. In contrast to the full sample, homeowners at the threshold are not affected by the treatments. I do not observe changes in the number of appeals nor in the counter offers they propose as alternative for the assessment. This experiment has clear limitations, which leads to

caution with the interpretation of the results. First, due to technical reasons the administration was unable to send the old notification letter during the same period as the treatments. As such, to estimate the effect of the Simplification the homeowners who received the notification in the year preceding the experiment had to be used as control group. Second, no information on the homeowners is available besides that it is an individual and not an organisation. As such, it is beyond the scope of this research to investigate which type of homeowners react to the interventions. Third, the research is unable to provide sound evidence on the underlying mechanisms that are driving the results.[7] For example, the clear differences between the reaction to the treatments by the owners of the single and multifamily housing can not be explained with our data. These limitation lead to avenues for further research.

The treatments proposed in this research do not restrict homeowners actions, they merely provide the homeowners with information or increases the ease at which information can be obtained. Therefore, they seem appropriate intervention to improve the appeal procedure. However, the findings presented in this paper show the opposite. While they do reduce the fraction of appealed assessments, in most cases they also reduce the horizontal equity of the tax base. This leads to the conclusions that governments should be careful with applying these kind of behavioural interventions in the setting of appeals against property assessments, as they have a high potential of backfiring and resulting in a lower degree of horizontal equity.

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[7]The initial set up of the experiment included a survey to elicit homeowners beliefs and explore how the treatments updated these beliefs. However, only a couple of homeowners took the time to answer the survey.

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A Appeal Examples

Figure 2. Example of an appeal due to wrong characteristics (1)

Geachte mevrouw, heer,

Ik teken bezwaar aan tegen uw toegestuurde beslissing voor toekenning van mijn kadastraal inkomen. Ik stuur een kopie van de beslissing met dit bezwaarschrift mee.

Het aantal m2 in uw beslissing klopt niet. Als bijlage stuur ik u een kopie van het verslag van goedkeuring van mijn samengevoegde appartement. Hierin leest u dat de totale oppervlakte 187 m2 is.

Ik maak van de gelegenheid gebruik om u alsnog een kopie van mijn EPC toe te sturen, bij een eerdere opvraging was ik nog niet in het bezit van dit certificaat. Echter de verslaggever maakte een fout in de nummering van appartementen. Mijn energielabel is het juiste hoewel er een ander appartementsnummer vermeld staat. Hierover nam ik contact op met de projectontwikkelaar en ze zouden mij binnen de 3 weken een nieuw document opsturen. Ondertussen heb ik het nog steeds niet ontvangen maar kon niet meer wachten met het indienen van dit bezwaarschrift. Vandaar dat u ook de mail, waarin bevestigd wordt dat er een fout nummer op staat, zal vinden als bijlage.

Vriendelijke groeten,

Notes: In the letter, the homeowners argues that the useful surface in the notification letter is larger than in reality.

Figure 3. Example of an appeal due to wrong characteristics (2)

Geachte heer, geachte mevrouw

In uw brief van 06-10-2021 stelt u het kadastraal inkomen van onze domicilie met bovenvermeld adres vast op 1307,00 euro.

Wij gaan niet akkoord met dit toegekend KI, gezien de feitelijke onjuistheid vermeld in de kenmerken van het goed: onze gezinswoning bevat slechts 1 kamer met bad en/of douche, waar uw brief er 2 vermeldt.

Mogelijk werd bij deze vaststelling uitgegaan van de technische bouwplannen, welke op de bovenste verdieping inderdaad een tweede badkamer van 12,774 m² vermelden. Finaal werd deze kamer echter niet als dusdanig ingericht. Ter staving vindt u hierbij 2 foto's van de kamer in kwestie.

Op basis van de correcte gegevens stellen wij zelf een kadastraal inkomen van 1200 euro voor.

Mocht u verdere vragen hebben, aarzelt u niet ons te contacteren.

In de hoop u hiermee van dienst te zijn geweest, verblijven we met de meeste hoogachting,

Notes: In the letter, the homeowners argues that the number of bathrooms in the notification letter is larger than in reality.

Figure 4. Example of an appeal based on value of the location (1)

Betreft: Bezwaar voorgesteld K.I.

Gemeente: .

Dossiernr.: MEOW-2019-DD

Geachte,

Met dit schrijven wens ik te onderschrijven dat ik NIET AKKOORD ga met het kadastraal inkomen van perceel sectie , perceelnr , partitie in straat 1 (Studio).

Dit werd nu betekend op 643 euro.

Het betreft echter een studio van amper 37,36 m² op de tweede verdieping. Er is geen lift en de studio heeft noch een terras, noch een balkon. Er is geen afzonderlijke slaapkamer.

Bovendien is het pand gesitueerd vlak naast de gevangenis op de hoek van een vrij drukke straat en een woonerf.

Mij lijkt in deze een KI van om en bij de 590 euro een correctere betekening.

Ik kijk alvast uit naar uw positieve feedback.

Met vriendelijke groeten,

Notes: In the letter, the homeowners argues that the CI must be lower due to a prison in the neighborhood.

Figure 5. Example of an appeal based on value of the location (2)

Bezwaar dossiernr. MEOW-2021-DD

Geachte mevrouw, geachte heer,

Ik kan niet akkoord gaan met de voorgestelde kadastrale inkomens van bovengemeld dossier. Vandaar dit bezwaarschrift. Gelieve ook rekening te houden met de geluidshinder omdat de woning gelegen is langs een grote baan.

Volgens mij moet aan het perceel een kadastraal inkomen toegekend worden van 800,00 €. Hopend op een gunstig gevolg aan dit bezwaarschrift, teken ik met de meeste hoogachting,

Notes: In the letter, the homeowners argues that the CI must be lower due to noise disturbance.

B Notification Letters

Federale

Overheidsdienst

FINANCIEN

RP |||||||||||||||||||||||||||||||||||||||||||||

~~BEGKENS, JULIETTE~~
~~GROENSTRAAT 0001~~
~~0040 HAM~~

Algemene Administratie van de Patrimoniumdocumentatie

Opmetingen & Waarderingen

Datum van de betekening: 02.02.2018

Betekening van het kadastraal inkomen

Mevrouw, Mijnheer,

Met deze betekening[1] delen wij u het kadastraal inkomen mee dat werd toegekend aan het perceel waarvan u de gegevens terugvindt in de onderstaande tabel. Dit kadastraal inkomen is geschat of herschat[2] om de reden(en) die hieronder is (zijn) vermeld in de rubriek 'Motivering'.

Deze betekening vervangt en vernietigt elke vorige betekening met betrekking tot het perceel.

GEMEENTE: 71033 - HAM 2 AFD/KWAADMECHELEN/
Dossiernr.: MEOW-2017-DD-01~~~~~~~~

GOEDEREN INGESCHREVEN IN DE PATRIMONIUMDOCUMENTATIE OP NAAM VAN:

~~BEGKENS, JULIETTE~~
~~SCHEPKENS, CHRISTINA~~
~~SCHEPKENS, BART~~
~~SCHEPKENS, PETER~~

LIGGING VAN HET PERCEEL (straat, nummer, plaatsnaam, gehucht) (bijkomende details)	Sectie	Perceel-nummer	Partitie[3]	AARD VAN HET PERCEEL		ha	a	ca	KLASSERING EN INKOMEN PER HA (ongebouwd)	Code	Bedrag EUR
1	2	3	4	5		6			7	8	9
~~GROEN~~STR 31	A	~~■■■■■~~	P0000	HUIS			11	07		2F	830

Motivering: Herschatting, aanzienlijke wijziging

O Het kadastraal inkomen geldt vanaf 01.09.2017[4].

BOUWTECHNISCHE KENMERKEN VAN HET PERCEEL (zie verklaring in bijlage):

C . 1 . Y . 1949 . 2017 / 2 . Y . 1 / 1 . 7 . 216

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[1] Overeenkomstig artikel 495, § 1, van het Wetboek van de Inkomstenbelastingen 1992 (zie bijlage).
[2] Overeenkomstig artikel 494, § 1 en § 2, van het Wetboek van de Inkomstenbelastingen 1992 (zie bijlage).
[3] Wanneer voor een kadastraal perceel een meer nauwkeurige identificatie nodig is, bijv. voor appartementsgebouwen, dan wordt het opgesplitst in een kadastraal planperceel en één of meer kadastrale patrimoniale percelen. In dat geval kan, per onroerend object waarop een eenheid van recht wordt uitgeoefend, de voormelde identificatie worden uitgebreid met een partitienummer. Het partitienummer staat niet vermeld op het kadastraal percelenplan.
[4] Overeenkomstig artikel 494, § 5, van het Wetboek van de Inkomstenbelastingen 1992 (zie bijlage).

.be

Figure 6. Old Letter (Front)

Waar vind ik meer informatie?

1. In de **bijlagen** vindt u meer informatie over de manier waarop het nieuw kadastraal inkomen werd vastgesteld en over de gegevens die u in deze brief vindt.

2. U kunt ook terecht bij de schatter van uw kadastraal inkomen. Daartoe neemt u contact op met de antenne Mutaties waarvan u de contactgegevens op de eerste pagina van deze brief vindt.

Wat moet ik doen?

0 Als u vindt dat het kadastraal inkomen van het perceel **correct** is, dan hoeft u **niets meer** te doen.

0 Als u niet akkoord gaat met het kadastraal inkomen van het perceel, dan kunt u bezwaar indienen.

Om een rechtsgeldig bezwaar[5] in te dienen, gaat u als volgt te werk:

1. Verzend uw bezwaar uiterlijk op 03.04.2018 per aangetekende brief.

2. Richt het aan de antenne Mutaties waarvan u het adres op de eerste pagina van deze brief vindt.

3. Vermeld het kadastraal inkomen dat volgens u aan het perceel moet worden toegekend.

Uw bezwaar moet gelijktijdig voldoen aan de drie bovenstaande voorwaarden. Anders is het niet rechtsgeldig en wordt het nietig verklaard.
Het is raadzaam om tevens uw telefoonnummer en e-mailadres te vermelden op uw bezwaar.

Opgelet!

0 Deze betekening vermeldt het niet-geïndexeerd kadastraal inkomen. Dit bedrag moet u niet betalen.

0 Het geïndexeerd kadastraal inkomen dient als basis voor de berekening van de onroerende voorheffing die u jaarlijks moet betalen.

Hoogachtend,

Philippe Herman
Administrateur

---

[5] Overeenkomstig artikel 499 van het Wetboek van de Inkomstenbelastingen 1992 (zie bijlage).

Figure 7. Old letter (Back)

Federale Overheidsdienst FINANCIEN

PATRIMONIUM-DOCUMENTATIE

ANTENNE MUT.702 PELT /2020-DD-00021943
Afz.: RINGLAAN 186 VERD 1 - 3900 PELT

RP ||| ||||| |||| ||

LIEVENS, MADELEINE
KERKESTRAAT 0043
3971 LEOPOLDSBURG

Datum betekening:	Dossiernummer:
04.09.2020	MEOW-2020-DD-00021943

Toekenning van uw kadastraal inkomen[1]

Beste MADELEINE LIEVENS,

Deze brief stelt u op de hoogte van het kadastraal inkomen (KI) dat aan uw perceel werd toegekend. Dat KI werd geschat aan de hand van de onderstaande kenmerken van het goed. De schatter van de Algemene Administratie van de Patrimoniumdocumentatie gebruikt de jaarlijkse nettohuurwaarde op het referentietijdstip 1975 voor het waarderen van de kenmerken eigen aan uw goed en zijn ligging. Het KI werd toegekend om volgende reden[2]:
Herschatting, aanzienlijke wijziging, comfort - verwarming

KENMERKEN VAN HET GOED

Constructietype	Halfopen bebouwing
Aard	HUIS
Aantal verdiepingen (gelijkvloers inbegrepen)	2
Bewoonbare dakverdieping	Niet aanwezig
Bouwjaar / Jaar laatste wijziging	1935 / ----
Aantal garages / Overdekte staanplaatsen en/of parkings	0 / -
Verwarming / Passiefwoning	Aanwezig / Nee
Aantal kamers met bad en/of douche	1
Bebouwde oppervlakte op de grond	103 m²
Nuttige oppervlakte[3]	138 m²

KENMERKEN VAN HET PERCEEL

Ligging	LEOPOLDSBURGSESTWG 33, LEOPOLDSBURG
Eigenaars (beperkt tot de eerste twee)	LIEVENS, MADELEINE
Perceelnummer	A 404 P 2 P0000
Perceeloppervlakte[4]	2 a 36 ca
Bijkomende details	-

Het kadastraal inkomen werd vastgelegd op 800 euro en geldt vanaf 01.09.2020.

Contactcenter
▪ Tel.: +32 (0)257 257 57 code: 18103

Raadpleeg uw online dossier op
www.myminfin.be

WWW.FIN.BELGIUM.BE **.be**
PATRIMONIUMDOCUMENTATIE • FEDERALE OVERHEIDSDIENST FINANCIEN

Figure 8. New letter (Front)

Waar vind ik meer informatie?

MyMinfin	Website	Contactcenter
U kunt via www.myminfin.be uw schattingsfiche aanvragen. 1. Meld u aan 2. Klik bij 'Mijn woning en mijn onroerende goederen' op 'Een kadastraal uittreksel aanvragen' en doorloop de verschillende stappen	Algemene info over het kadaster en veelgestelde vragen www.fin.belgium.be > Particulieren > Woning > Kadaster > Kadastraal inkomen	+32 (0)257 257 57 code: 18103 Alle werkdagen van 8.30 tot 17 uur U kunt via dit nummer ook een afspraak met de schatter maken.

Wat moet ik doen?

- Het toegekende bedrag is het niet-geïndexeerde kadastraal inkomen. **Dat bedrag moet u niet betalen!** Het geïndexeerde kadastraal inkomen dient als basis voor de berekening van de onroerende voorheffing die u jaarlijks moet betalen. Het te betalen bedrag hangt af van de tarieven die van toepassing zijn voor de gemeente waarin uw goed ligt. De bevoegde instantie (federale overheid of gewest) stuurt u een bericht op het moment dat de onroerende voorheffing betaald moet worden.
- Gaat u akkoord met het bedrag, dan moet u niets doen.
- Gaat u niet akkoord met het bedrag, dan kunt u een bezwaar indienen.

    Om een rechtsgeldig bezwaar in te dienen, gaat u als volgt te werk:
    1. Verstuur uw bezwaar uiterlijk op 04.11.2020 per aangetekende brief.
    2. Richt het aan de antenne Mutaties waarvan u het adres op de eerste pagina van deze brief vindt.
    3. Vermeld het kadastraal inkomen dat volgens u aan het perceel moet worden toegekend.

Met vriendelijke groeten

De administrateur Opmetingen en Waarderingen

Wilt u helpen om onze werking te verbeteren?
Schrijf u in voor een enquête in samenwerking met de KU Leuven.
U kunt daarvoor de QR-code scannen via de camera van uw smartphone.

---

[1] Deze brief is de betekening van het kadastraal inkomen. Deze betekening vervangt en vernietigt elke vorige betekening met betrekking tot het perceel.
[2] Artikel 494 § 1 en § 2 van het Wetboek van de inkomstenbelastingen 1992.
[3] De nuttige oppervlakte is de totale gewogen oppervlakte van alle verdiepingen van uw goed (muren inbegrepen). Een woonkamer wordt bijvoorbeeld gerekend aan 100 % en een niet-bewoonbare kelder aan 10 %.
[4] De perceeloppervlakte kan afwijken van de oppervlakte opgenomen in de akte.

Figure 9. New letter (Back)

Created by PDF-Composition

Waar vind ik meer informatie?

MyMinfin

U kunt via www.myminfin.be uw schattingsfiche aanvragen.

1. Meld u aan
2. Klik bij 'Mijn woning en mijn onroerende goederen' op 'Een kadastraal uittreksel aanvragen' en doorloop de verschillende stappen

Website

Algemene info over het kadaster en veelgestelde vragen

www.fin.belgium.be
> Particulieren > Woning > Kadaster
> Kadastraal inkomen

Contactcenter

+32 (0)257 257 57
code: 18103
Alle werkdagen van 8.30 tot 17 uur

U kunt via dit nummer ook een afspraak met de schatter maken.

Wat moet ik doen?

- Het toegekende bedrag is het niet-geïndexeerde kadastraal inkomen. **Dat bedrag moet u niet betalen!** Het geïndexeerde kadastraal inkomen dient als basis voor de berekening van de onroerende voorheffing die u jaarlijks moet betalen. Het te betalen bedrag hangt af van de tarieven die van toepassing zijn voor de gemeente waarin uw goed ligt. De bevoegde instantie (federale overheid of gewest) stuurt u een bericht op het moment dat de onroerende voorheffing betaald moet worden.
- Gaat u akkoord met het bedrag, dan moet u niets doen.
- Gaat u niet akkoord met het bedrag, dan kunt u een bezwaar indienen.

Om een rechtsgeldig bezwaar in te dienen, gaat u als volgt te werk:
1. Verstuur uw bezwaar uiterlijk op 04.11.2020 per aangetekende brief.
2. Richt het aan de antenne Mutaties waarvan u het adres op de eerste pagina van deze brief vindt.
3. Vermeld het kadastraal inkomen dat volgens u aan het perceel moet worden toegekend.

Let op! De doorlooptijd van een bezwaar duurt gemiddeld **213 dagen**.

Met vriendelijke groeten

De administrateur Opmetingen en Waarderingen

Wilt u helpen om onze werking te verbeteren?
Schrijf u in voor een enquête in samenwerking met de KU Leuven.
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---

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[3] De nuttige oppervlakte is de totale gewogen oppervlakte van alle verdiepingen van uw goed (muren inbegrepen). Een woonkamer wordt bijvoorbeeld gerekend aan 100 % en een niet-bewoonbare kelder aan 10 %.
[4] De perceeloppervlakte kan afwijken van de oppervlakte opgenomen in de akte.

Figure 10. Message (Back)

C   RD-estimates

Table 6. Regression Discontinuity Estimated for the Treatments at the Reduction Threshold

	Old Letter	Simplification	Short Time	Long Time	Success Rate
	(1)	(2)	(3)	(4)	(5)
RD-estimate	0.025***	0.034	0.046*	0.019	0.049*
	(0.008)	(0.021)	(0.025)	(0.019)	(0.029)
Observations	34,225	9,846	5,136	5,116	4,542

Note: This table presents the regression discontinuity estimate for the discontinuity at the 745 EUR threshold for the assessments in Wallonia. The estimation is based on the approach set out by Calonico et al. (2014). Robust standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.