

DISCUSSION PAPER SERIES

IZA DP No. 17722

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Code Complexity**

Stephen Kastoryano

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## ABSTRACT

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# The Unintended Consequences of Tax Code Complexity\*

This paper reveals how tax complexity, in the form of loopholes and assets overlapping different sections of tax returns, contributes to tax avoidance and evasion. Using administrative data from the Netherlands, it shows how an auditing announcement in 2005 triggered large increases in declared assets and properties, predominantly held by the wealthiest segments of society, in unexpected sections of the tax returns. It further takes advantage of a one-year reduction in the dividend tax rate, which coincided with another auditing announcement in 2007, to more specifically assess strategic spontaneous declarations and shifting among shareholders, particularly those with substantial company holdings. The results highlight taxpayer contingency plans and opportunistic behaviour when declaring previously hidden wealth. They also emphasize how the ambiguity of certain assets' classifications can be coopted to strategically shift wealth in response to new tax policies.

**JEL Classification:** H26, H83, K34

**Keywords:** tax complexity, tax evasion, tax avoidance, auditing announcements

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# 1 Introduction

A longstanding literature on tax evasion considers taxpayers' static and dynamic responses to random audits and audit letter nudges (Slemrod et al., 2001; Kleven et al., 2011; Fellner et al., 2013; Slemrod, 2019). More recent work exploiting offshore account data leaks and tax amnesties shifts focus to taxes evaded by the wealthiest (Alstadsæter et al., 2019; Guyton et al., 2021; Leenders et al., 2023; Londoño-Vélez and Avila-Mahecha, 2024). This literature has grown in conjunction with that on behavioural responses to changes in dividend and wealth taxes (Chetty and Saez, 2006; Scheuer and Slemrod, 2021; Rotberg and Steinberg, 2024). Several well-known insights emerge from this research: tax evasion occurs most often on items not verified by third-party information; taxpayers react to announcements concerning newly held fiscal information; the upper quantiles of the wealth distribution have more avenues for legally avoiding taxes, and are also responsible for the largest amount of evaded taxes in absolute numbers.

Less well understood is how complexity, in the form of loopholes and assets overlapping different sections of tax returns, contribute to tax avoidance and evasion, in particular among the wealthy. This paper exploits an unusual series of auditing announcements in the Netherlands to show, using administrative data, how taxpayers strategically declare previously evaded wealth in order to avoid scrutiny. It further takes advantage of a one year reduction in the dividend tax rate, which coincided with one of the announcements, to more narrowly assess strategic spontaneous declarations and shifting among shareholders, particularly those with substantial company holdings.

In January of each year, the Netherlands Tax and Customs Administration announce to the public – through radio, television, newspaper and internet announcements – a specific topic in the tax returns of the previous fiscal year that will be subjected to intense auditing. Two of these announcements, those of 2005 and 2007, touched on complex topics of particular interest.

The 2005 announcement targeted *income from freelance work* which is listed in Box 1, one of three Boxes, or sections, of the Dutch tax reports. This topic is peculiar in that it is linked through a set of steps to several wealth related tax categories. If, in the tax form, taxpayers fill in declarations for *income from freelance work*, they are also directed to fill in an additional entry which elicits declarations from a second category in Box 1: *profits from assets made available*. When filling in the additional entry, taxpayers are required to list their Box 1 returns concerning three topics: *other assets*, *other property* and *debts*. These topics include profits from rented property other than a person's first or second home, a large array of dividends and capital gains, as well as mortgages and other obligations. Besides their ambiguous definition, these three items are unique in that they can be declared in any of Box 1, Box 3 and, in some circumstances, Box 2. Importantly, above a relatively low monetary threshold, the tax rates in Box 3 are significantly lower than those in Boxes 1 and 2.

Using administrative longitudinal data from the Netherlands Tax and Customs administration covering 2002-2008, the first set of results in this paper show that the 2005 announcement produced marginal, if any, increases in declarations of *income from freelance work* and showed no changes in the related Box 1 category *profits from assets made available*. It did, however, produce notable jumps in Box 3 declarations of *other assets* and *other property*.

The second set of results focuses on wealth changes in 2007 resulting from two concurrent

occurrences influencing tax incentives. The first was the 2007 auditing announcement which focused on all items in Box 3, the tax section grouping returns for different categories of investments and savings. The second was a one-year drop in the dividend tax rate from 25% to 22% on the first €250,000 declared in Box 2, the section relating to income from a substantial business interest (over 5% shareholding in a company). The analysis does not indicate noticeable shifts away from Box 3 for *other assets*, *other property* or *debts* in reverse to what is observed for 2005. They do, however, show a jump in *profits from assets made available*. In addition, the results show that the Box 2 rate cut lead to a €2.1 billion one-year jump in capital income taxes, the payouts of which appear mainly in Box 2, but also across various sections of the tax returns including in Box 3: *other assets*, *share dividends and bonds* and *savings*. This revelation of otherwise withheld company profits led to several policy changes over the following years which we expand on.<sup>1</sup>

The paper further explores the intersection between both policies by looking at the population subsamples most likely to respond to the announcements and heterogeneous effects by employment and demographic characteristics. One notable result is that the effects in 2005 and 2007 are mainly driven by taxpayers who did not file as entrepreneurs. In terms of socio-demographic characteristics, the results show that the effects are always driven by the characteristics most correlated to high wealth and in particular by people working in the financial and business service sector.

Because all taxpayers are exposed to the spotlight announcements and the dividend tax cut, we cannot credibly formulate separate treatment and control groups. As such, the results should be considered as lying somewhere between descriptive, as the methodology does not use what would traditionally be considered a causal approach, and causal, as the incentive changes and tax code structure offer clear predictions on which tax topics should and should not be affected by the announcements and dividend tax rate reduction.

The results in this paper build on several strands of literature. First, we add to research showing how announced auditing increases in one tax area or on a set of taxpayers can produce spillovers in other taxes, over time, or on other taxpayers (Le Maire and Schjerning, 2013; Devereux et al., 2014; Boning et al., 2020). In particular López-Luzuriaga and Scartascini (2019) and Castro et al. (2022) show that various forms of auditing letter messages - penalties, detection, social norms - can increase declarations on the targeted tax item but also produce negative spillovers on other items if agents perceive auditing capacity as limited. Shifting of wealth can also be motivated by purely financial reasons as in Alstadsæter and Jacob (2016) which shows that a permanent reduction in the dividend tax rate leads to income shifting across tax returns, in particular for director-large shareholders.

In terms of contributions, this paper underlines how complexity in tax returns, in the form of loopholes and overlaps, can, unexpectedly, produce important knock-on consequences even for seemingly small changes in tax policies. In the current context, this complexity opens additional channels through which the wealthy can evade and avoid scrutiny. These channels compound inequalities in tax advantages that can result from differences in resources (e.g. using a tax professional) and human capital (Abeler and Jäger, 2015; Bhargava and Manoli, 2015;

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<sup>1</sup>The direct effect of the tax cut on Box 2 declarations has already been documented, among others, in Bettendorf et al. (2017).

Feldman et al., 2016; Craig and Slemrod, 2024), and differences in access to off-shore banks and other international wealth holdings (Alstadsæter et al., 2022b; Bomare and Herry, 2022; Johannesen et al., 2022). In addition, this paper offers insights into the effects of a one-time dividend tax cut, which may be different to those of a permanent dividend tax cut (Chetty and Saez, 2006; Alstadsæter et al., 2022b). Finally, it underlines how the ambiguity of certain assets' classification leaves discretion for wealthy taxpayers to re-optimize their tax declarations strategically in response to new tax policies.

## 2 Institutional Background

Since 2001, the Dutch tax system divides tax declarations into three categories, or Boxes, as described in detail in Appendix Table A1. Broadly speaking, Box 1 relates to wages, profits, social security benefits and pensions, Box 2 taxes distributed dividends and capital gains to taxpayers with shareholding of at least 5% in a company, and Box 3 covers all other wealth from savings and investments.<sup>2</sup>

### 2.1 Auditing Announcements

In addition to common auditing practices - targeted criteria, thresholds, random selection - the Netherlands Tax and Customs Administration selects a spotlight topic each year to be the subject of additional scrutiny. The motivation for choosing spotlight topics varies each year. In some years, the topic is selected based on the suspicion of high levels of fraud, while in other years the intention is to educate the public on complex tax topics. The spotlight theme for fiscal year  $t$ , which follows the calendar year, is always announced to the public in the first days of January in year  $t + 1$ .

Notifications of the spotlight topic are publicized through newspapers, magazines, radio, television and internet announcements, and are made evident on the front page of the tax authorities website.<sup>3</sup> The spotlight announcement auditing threat is not cheap talk. The auditing campaign for the 2005 topic involved a thorough preliminary screening of all people liable, through third-party information or self-declaration, to pay taxes on income from freelance work and a full audit of 25% of these declarations. The auditing campaign in 2007 went through stricter preliminary screening than in other years and saw a hundred-fold increase in the number of full audits for topics in Box 3. Where misreporting is detected, taxpayers may receive fines up to 100% of the evaded sum.<sup>4</sup>

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<sup>2</sup>Box 1 follows a progressive tax over four tax brackets which in 2005 had cutoffs at €16,893, €30,357 and €51,762. The income in each bracket is taxed at 1.80%, 9.35%, 42% and 52%. For income under €30,357 there is also a 32.60% flat rate for social security contributions. Box 2 income is subject to a flat tax of 25%. Box 3 can be allocated optimally between fiscal partners. Individually declared income in Box 3 over €19,522 is subject to a 30% flat tax which is taken on a fixed assumed return of 4% of the average yearly net value of the assets minus any liabilities. Because the tax is taken on the average in Box 3, an increase  $x$  in a given year from a baseline of  $y$ , the tax would be  $0.3 \cdot 0.04 \cdot (y - 19,522) + 0.3 \cdot 0.04 \cdot x/2$ , which amounts to a 0.6% wealth tax on Box 3 increases.

<sup>3</sup>For the 2005 announcement, in addition to the widespread campaign, letters were sent to the 181,551 taxpayers who declared *income from freelance work* in 2004. The letter informed people to take particular care in filling their returns for income from secondary sources such as freelance work income, which falls within Box 1. The Box 3 announcement in 2007 emphasized the categories of additional property, personal assets, savings and investments.

<sup>4</sup>Appendix A describes in more detail the Dutch tax system, timelines and the choice of spotlight announcements.

## 2.2 2007 Dividend Tax Cut

The 2007 dividend tax cut was designed as a short term compensation for directors and major shareholders as an interim response to new legislation. In 2006, the Dutch government introduced a Health Insurance Act which required employees to pay a 6.5% contribution on their wages while self-declared entrepreneurs paid a lower rate of 4.4% on their taxable business profits. This discrepancy led to a higher burden on large shareholding company directors, who fall under the category of ‘employees’, rather than ‘entrepreneurs’. This difference was deemed unfair but could not be rectified before 2008 due to technical difficulties. In response, the government temporarily reduced the Box 2 tax rate by 3 percentage points in 2007, lowering the tax on returns from substantial interest from 25% to 22% for declarations up to €250,000.

## 3 Data

The analysis uses longitudinal data from the Netherlands Tax and Customs Administration for 2002-2008, which include annual individual tax declarations as well as individual socio-demographic and employment characteristics.<sup>5</sup>

We consider two balanced samples for the analysis. The first is a focused random sample of individuals whose incentives are most likely to be affected by the 2005 auditing announcement. More precisely, we draw a representative sample of 49,486 individuals, followed from 2002 to 2008, from the pool of taxpayers declaring positive or negative returns in the Box 1 category of *profits from assets made available*. The second sample is a representative sample of all taxpayers and tax liable individuals who did not file taxes.<sup>6</sup>

Appendix B provides tables describing and comparing these two samples. Most importantly, concerning aggregated wealth, 33.6% (10.9%) of individuals in the targeted sample earn more than €60,000 (€120,000) a year in wealth (including employment income), compared to 3.5% (0.6%) in the representative sample of tax liable individuals. Notably, 45.7% of individuals in our analysis sample work in the banking and financial service sector, as compared to 12.3% in the representative sample, and 83% of these taxpayers file reports with the assistance of tax professionals, as compared to 18.4% in the representative sample. Unsurprisingly, individuals in the targeted sample are also far more likely to make declarations in all overlapping categories of Boxes 2 and 3, including declarations of *other property* (28.2% vs. 2.4%), *other assets* (4.9% vs. 0.6%), and *debts* (47.2% vs. 5.6%).

Figure 1 presents the aggregate trends for four of our main outcomes of interest in the sample of taxpayers declaring *profits from assets made available*. We notice distinctly higher changes in average declarations of *other property* and *other assets* in 2005. We also notice a large jump in average yearly declarations of Box 2 in 2007 which then falls back to previous levels in 2008. We also see similar changes for *profits from assets made available*, although noisier and at a far smaller scale.<sup>7</sup>

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<sup>5</sup>The Dutch tax system was overhauled in 2001, so that year is excluded as an unusual learning year of the new tax code. Furthermore, the financial crisis hit the Netherlands most seriously in 2009 which severely affected trends in categories related to wealth.

<sup>6</sup>More specifically, the sample includes individuals who, over 2002-2008, either declared Box 3 returns, or for whom third party Box 3 information is available, which includes nearly 80% of the Dutch population

<sup>7</sup>In Appendix B.1 we further present aggregate trends for other main tax categories. We see no clear difference for declarations of *debts* and a large variance in year-to-year declarations of *income from freelance work*. Note that declarations of Box 3 are always positive but *profits from assets made available*, *debts* and Box 2 can take

Figure 1: Yearly changes in average declarations 2002-2008

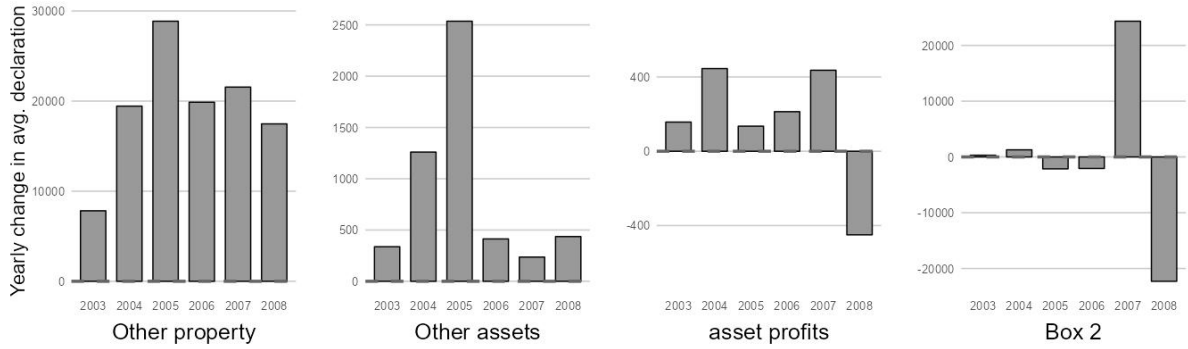


Figure 2: Box 2 declarations 2006-2008

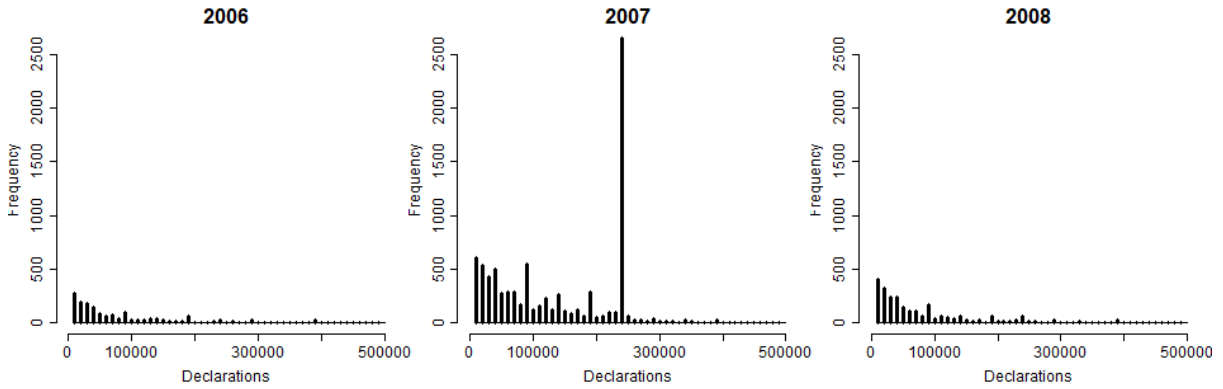


Figure 2 considers in greater detail the strategic response to the 2007 tax rate cut for the first €250,000 of Box 2 declarations by comparing it to Box 2 declarations in 2006 and 2008. The reaction to the dividend tax cut is evident from the bunching around the €250,000 threshold.<sup>8</sup> In total, 19.1% of the targeted sample declared positive Box 2 returns in 2007 as compared to an average of 6.3% of the sample in other years.

## 4 Model and Identification

Because all taxpayers are exposed to the spotlight announcements and the dividend tax cut, we cannot formulate separate treatment and control groups. Instead, we take the approach of an interrupted time series with the aggregate trends presented in Figure 1 informing our empirical specification. We model the baseline declarations in all years from 2002-2008 other than 2005 and 2007, and estimate the effects of announcements in 2005 and 2007 as year specific bumps in declarations. More precisely, for taxpayer  $i = 1, \dots, N$  in year  $t = 1, \dots, T$ , we model the tax declarations on a topic  $y_{it}$  with the first difference transformation of the specification,

$$y_{it} = \alpha_i + f(t) + \beta_{2005} \cdot \mathbf{1}(\text{year} = 2005) + \beta_{2007} \cdot \mathbf{1}(\text{year} = 2007) + u_{it} \quad (1)$$

on positive and negative values.

<sup>8</sup>83% of taxpayers with Box 2 declarations in 2007 between €240,000-€260,000 declared €0 Box 2 returns in 2006 and 80% of them declared €0 Box 2 returns in 2008. These numbers are, however, not dissimilar to other taxpayers' changes in Box 2 declarations.



We are interested in the parameters  $\beta_{2005}$  and  $\beta_{2007}$  which approximate the average change in tax declarations in the years 2005 and 2007 relative to the baseline individual level plus a topic specific trend given by  $\alpha_i + f(t)$ .  $\alpha_i$  is an individual specific intercept while  $f(t)$  is specified such that there is a linear time trend in the first difference. We do not include time varying demographic or employment covariates since these may be bad controls endogenous to evasion.<sup>9</sup>

The underlying assumption is that the baseline trend adequately captures the expected counterfactual declarations for 2005 and 2007. Speaking to this assumption, anticipation effects with respect to spotlight topics are unlikely since these are only announced internally one to two months prior to their public release. Announcements in other years also concerned tangential topics unlikely to affect those under study.<sup>10</sup> With that said, the dividend tax cut applied to Box 2 was known in advance, allowing major company shareholders to decide on the optimal distribution of dividends in advance.

Additionally, our model ignores some types of long run announcement effects in post-announcement years. In particular, the salience (Chetty et al., 2009) of announcements may induce a set of negligent taxpayers to apply greater effort in understanding their true tax liability, an effect which may be long-lasting. Rectified under-reporting due to negligence would lead to underestimating the magnitude of  $\beta_{2005}$  and  $\beta_{2007}$ . These parameters would also be underestimated if the threat effect of the announcements were persistent past the initial announcement year as shown for audit effects in Boning et al. (2023). Other post-announcement-year effects are integral to our study. These include ‘crater’ effects, whereby individuals sharply increase their evaded taxes after announcement years. A final problem is that announcement effects will still underestimate misreporting since we cannot capture undeclared funds from taxpayers who never react to announcements and keep returns hidden in all years.

## 5 Results

### *2005 Effects on Targeted Sample*

Figure 3 presents the main results for the targeted random sample which declared *profits from assets made available*. The figure presents point estimates and 95% confidence intervals of  $\beta_{2005}$  and  $\beta_{2007}$  for each of the listed tax topics. We see that upon the 2005 announcement, there do not appear to be any significant changes in the declarations of the targeted (*income from freelance work*) and inadvertently targeted (*profits from assets made available*) topics in Box 1.<sup>11</sup> We do see, however, significant jumps in declarations for the Box 3 topics *other property* and, to a lesser statistical certainty, in *other assets*.<sup>12</sup>

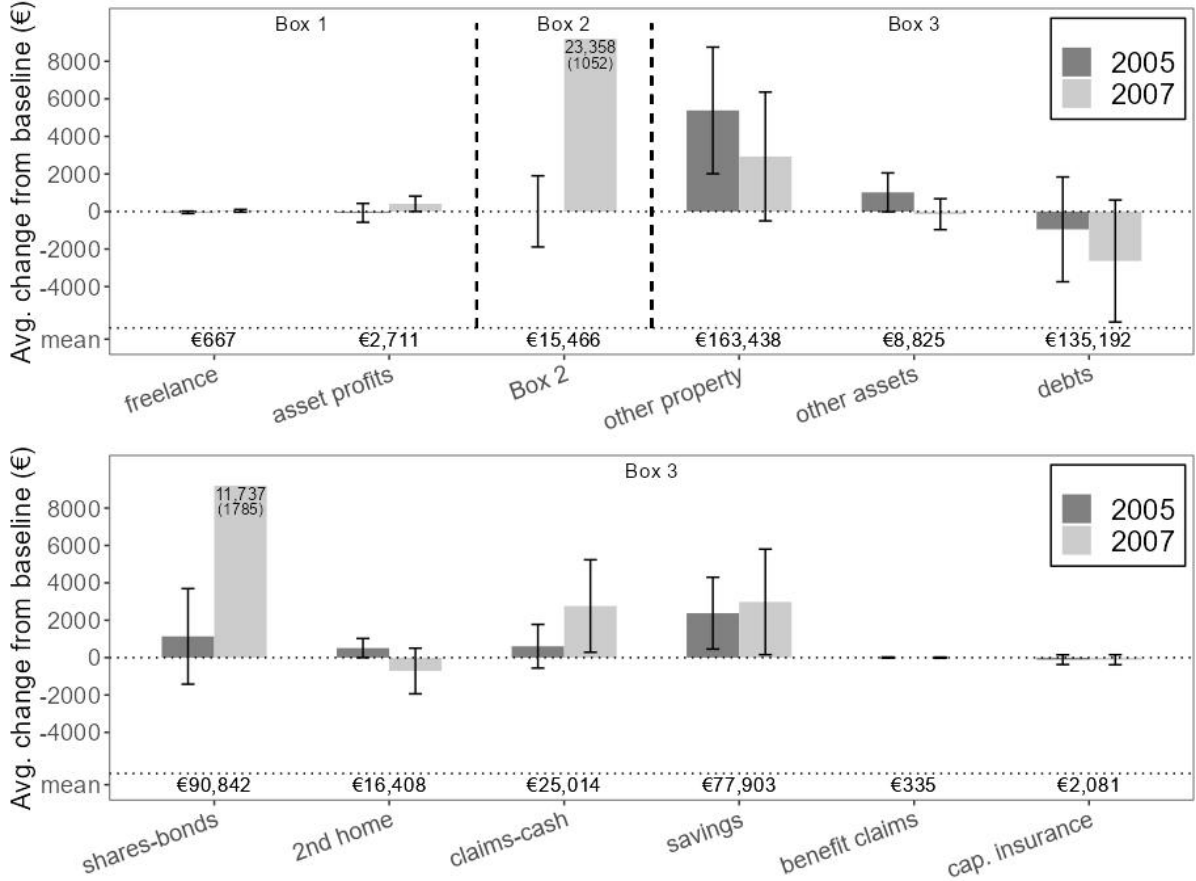
<sup>9</sup>As is well-known, effects in levels can be pulled by relatively few large changes in declarations at the top end of the wealth distribution. As such, we also show results with a log specification of the outcome in Appendix B.2. Because the results in logs are qualitatively very similar to the ones presented in levels in the main text, we refrain from discussing them and leave them as a robustness check to our results for taxpayers in the middle of the wealth distribution. In Appendix B.2, we also present the share of positive, zero (and negative) declarations for each outcome of interest which offers insights into changes at the extensive margin.

<sup>10</sup>Listed and discussed in Appendix A.

<sup>11</sup>To inspect the zero-effect result on the directly targeted *income from freelance work*, we also analysed the results on a 2002-2008 representative sample of taxpayers declaring *income from freelance work*. The result, not presented in a table, shows a positive point estimate of €134 on *income from freelance work*, but this effect is not significant at traditional levels (p-value 0.18).

<sup>12</sup>We see no significant effect on *debts*, the final of the three topics listed under all Boxes, possibly due to two counteracting forces. It may be that experienced taxpayers over-declare debts, which enter negatively in tax

Figure 3: Targeted sample declaration effects in 2005 and 2007



Note: These figures show the estimate and 95% confidence interval of parameters  $\beta_{2005}$  and  $\beta_{2007}$  for separate estimations of equation 1 depending on the outcome. The bars for *Box 2* and *shares-bonds* estimates of  $\beta_{2007}$  are truncated for aesthetic reasons with point estimates and standard errors given on the bar plot. Standard errors are clustered at the individual level. The means at the bottom of the plots correspond to the mean of the topic specific outcome over years 2002-2008 excluding years 2005 and 2007.

Figure 3 further assesses changes for 2005 declarations on all other Box 3 topics which are not explicitly mentioned in relation to *profits from assets made available* in Box 1. We notice significant increases only in savings declarations although, as presented in Figure A1 of Appendix B.1, this appears to be because of a drop in savings in 2006, rather than an increase in savings in 2005. We also see marginal increases in declarations of a second home, a category which may itself be linked to the strong increase in *other property* declarations. These results showing shifts in property related wealth point to a recent literature discussing wealth held in foreign property (Alstadsæter et al., 2022b; Bomare and Herry, 2022; Johannesen et al., 2022).

This first set of results for 2005 shifts are consistent with underlying incentives. Taxpayers hiding complex assets face a higher probability of audit in 2005 since only 3.4% of taxpayers declare *income from freelance work* or *profits from assets made available* yearly. Facing the uncertainty of a new targeted audit, there is a stronger incentive to declare hidden wealth. In

returns, in normal years but reduce these when faced with a higher probability of audit in 2005. At the same time, declarations in other property and other assets are often paired with mortgage payments or other forms of debt which would increase as taxpayers increase their declarations in the other two topics. Klepper and Nagin (1989) give similar arguments and more detailed explanations on how counteracting effects in the US TCMP tax data can explain declaration patterns for related tax topics.

response to these incentives, a rational taxpayer in traditional crime models would establish, if declarations can fall under several categories, where in the tax returns to optimally declare hidden wealth. A first consideration, given the added scrutiny in 2005, is that declaring hidden wealth in a tax category immediately linked to the announcement category may draw attention to the taxpayer's returns. Perhaps more importantly, the tax liability for newly declared wealth is higher by a considerable margin in Box 1 than in Box 3 (42% to 52% vs. 0.6% marginal tax rate). We also do not observe any shifts into Box 2. This could again be due to financial incentives, since Box 2 declarations are taxed at 25%, but also because Box 2 has a clearer delineation encompassing only returns from companies where the taxpayer holds above 5% of shares in a company.

From a behavioural point of view, these shifts suggest that taxpayers make contingency plans when declaring previously hidden wealth. By declaring previously hidden assets and property profits in Box 3, taxpayers, if audited, can claim to have lawfully declared their taxes in that year, and possibly avoid scrutiny for previous years. The tax evasion and avoidance behaviour we describe is notably different from [Alstadsæter et al. \(2022a\)](#) who, when studying a tax amnesty program in Norway, found no strong substitution between evasion and avoidance. This difference likely arises because, in contrast to revealing wealth in response to tax amnesties, taxpayers caught for evasion in our setting would be liable to additional fines for evasion in previous years.

### ***2007 Effects on Targeted Sample***

The effects of 2007 combine the effects of two occurrences: the 2007 Box 3 announcement and the dividend tax cut to Box 2. Between the two, the dividend tax cut likely explains the majority of the measured changes in declarations for several reasons. First, the 2007 announcement was less targeted, focusing on the entirety of Box 3 declarations, for which 90% of the Dutch taxpaying population either declares or has third party information declared for them. As such, taxpayers holding complex assets, who are in general in the wealthiest segments of society, will be less narrowly targeted by the announcement than in 2005. Second, while financial incentives induce shifts towards revealing hidden wealth in Box 3 in 2005, the opposite of declaring hidden wealth in Box 1 as a contingency plan would entail a considerable tax burden. Last, following revelations of wealth in 2005, a cycle of revealing and hiding substantial wealth thereafter would likely transpire as suspicious.

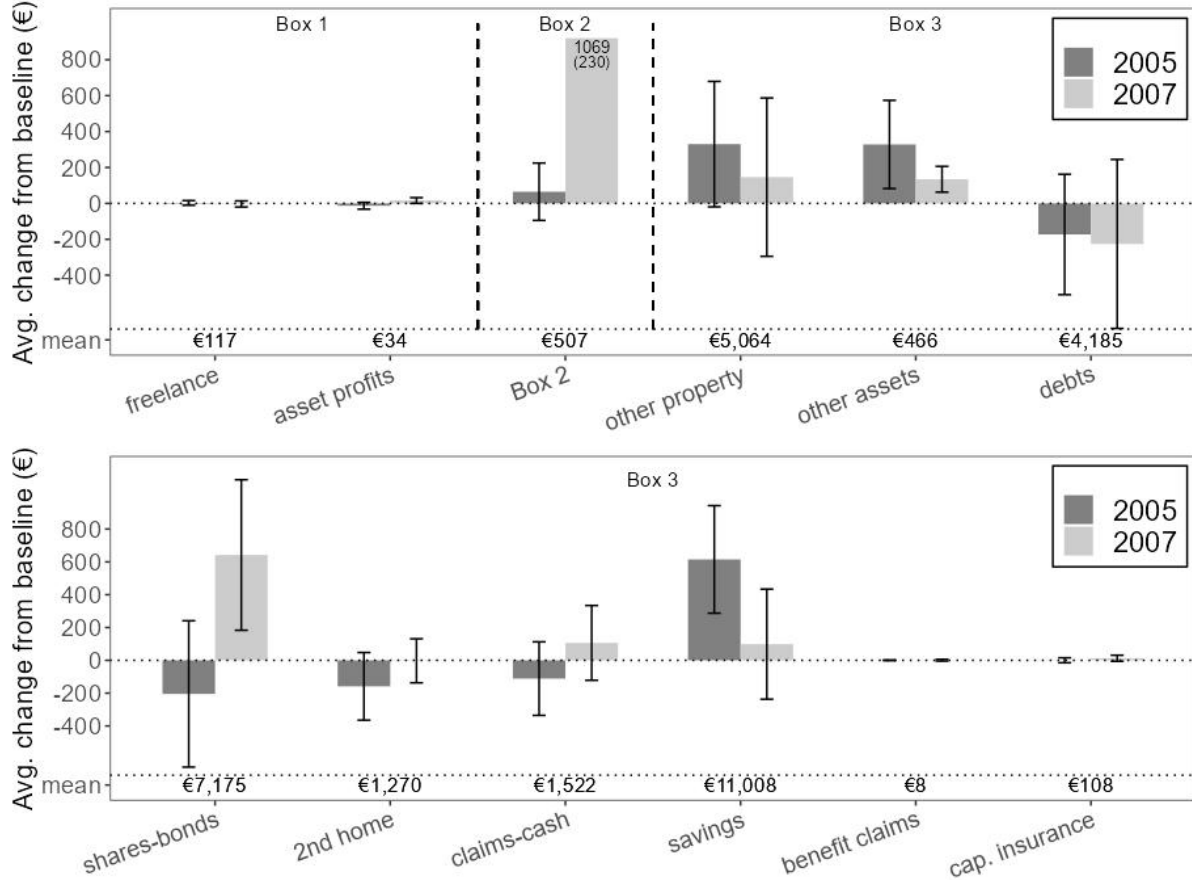
The largest noticeable effect of the 2007 dividend tax cut is visible in Box 2 which jumps by 151%, a result already documented in [Bettendorf et al. \(2017\)](#).<sup>13</sup> But, because dividends will also be distributed to shareholder with stakes below 5% in the companies, we also see jumps in other wealth categories. The largest increases, in percentage and absolute terms, is in the main Box 3 *shares and bonds* category. Jumps also appear in the Box 3 categories of *claims and cash*, *other property* and *savings*. Despite the lower probability of audit and the higher financial cost, we also see a bump in *profits from assets made available* in Box 1. This could be attributed to an economic decision to avoid declarations in the targeted topic of Box 3 in 2007, or due to small fiscal advantages to directors-large shareholders for low levels of declarations ([Bettendorf et al., 2017](#)). We revisit the broader implications of the response to the dividend tax cut in the following section.

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<sup>13</sup>[Bettendorf et al. \(2017\)](#) focus specifically on shifting behaviour for large shareholding directors.

## 2005 and 2007 Effects on Representative Sample

Figure 4: Representative sample declaration effects in 2005 and 2007



Note: These figures show the estimate and 95% confidence interval of parameters  $\beta_{2005}$  and  $\beta_{2007}$  for separate estimations of equation 1 depending on the outcome. The bar for the *Box 2* estimate of  $\beta_{2007}$  is truncated for aesthetic reasons with point estimates and standard errors given on the bar plot. Standard errors are clustered at the individual level. The means at the bottom of the plots correspond to the mean of the topic specific outcome over years 2002-2008 excluding years 2005 and 2007.

The previous results present shifts and reactions for a subset of taxpayers particularly liable to react to the 2005 announcement. In this section we consider the effects of the announcements and dividend tax cut more broadly for a representative sample of the taxpaying population. These results are presented in Figure 4.

Although the shifts in declarations are generally the same, with *other property* and *other assets* showing jumps in 2005, and *Box 2* and *Box 3 shares and bonds* showing jumps in 2007, we also note some relevant differences. First, the declarations of *other assets* appear more reactive both in 2005 and 2007 in the general population than for the 2005 announcement targeted sample. In addition, in percentage change terms, the increase in *Box 2* declarations in 2007 is larger than for the 2005 announcement targeted sample. A simple explanation for this is that director-large shareholders are less likely to ever make declarations in *profits from assets made available* and therefore less likely to appear in the previous targeted sample.

Extrapolated to the entire taxpaying population, the effects of the *other property* and *other assets* increases in 2005 amount to approximately €30 million in previously undeclared taxes.

The effect of the dividend tax cut represents a €2.1 billion increase in levied taxes for 2007.<sup>14</sup> Although unexpected, this increase did not go unnoticed by the Dutch government.<sup>15</sup>

The Dutch government leveraged the insights from 2007 when facing a balance of payments deficit in 2014 by deliberately reducing the Box 2 tax rate. This produced the expected effect of raising tax revenue from Box 2 dividend payouts. A similar spike arose yet again in 2019, although this time anticipatory, in response to the proposed Box 2 tax rate increase from 25% to 26.9% and the announcement that borrowing from one’s own company would be restricted.<sup>16</sup>

### ***Heterogenous Effects***

Table 1 considers heterogenous effects in 2005 and 2007 for a select number of outcomes. Looking at the representative sample, we focus on the changes for *other assets* in Box 3 and for *profits from assets made available* in Box 1 in 2005, and on changes in Box 2 in 2007 due to the dividend tax cut. We summarize these results here. The results indicate that the jumps in *other assets* in 2005 are mainly driven by taxpayers with average declarations above €100,000, although the effects are also significant and positive for less wealthy taxpayers. The 2007 jump in Box 2 is exclusively driven by taxpayers with declared wealth above €100,000. The results also indicate that the wealthy group declared lower *profits from assets made available* in 2005, emphasizing the strategic shifting of funds.

Unsurprisingly, given the high correlation with wealth, these same effects replicate almost entirely when considering heterogeneous effects depending on whether a taxpayer listed a tax professional. The only difference is that the increases in *other assets* in 2005 are driven exclusively by people with a tax professional.<sup>17</sup> We also consider heterogenous effects depending on the biological sex of the taxpayer. The results show that increases in *other assets* in 2005 were primarily driven by men while the increases in Box 2 in 2007 were positive for both men and women, but larger for men. These differences again are likely due to a positive correlation with wealth.

The heterogeneity results also consider differences in declarations for taxpayers who filed as entrepreneurs.<sup>18</sup> The effects show that the increases in *other assets* in 2005 and the increases in Box 2 declarations in 2007 were mainly driven by taxpayers who did not file as entrepreneurs. One explanation for the lack of 2005 response is simply that entrepreneurs have many other margins on which to evade and avoid taxes, so they did not respond as strongly to the 2005 announcement. The lack of response in Box 2 for entrepreneurs is consistent with the intent of the policy, which aimed at compensating large non-entrepreneur shareholders for the inequity in the 2006 Health Insurance Act.<sup>19</sup>

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<sup>14</sup>The implied elasticity of Box 2 declarations was approximately 0.7.

<sup>15</sup>While not the focus of this study, the repeated jumps in Box 2 declarations are relevant to studies focused on profit retention by directors-large shareholders discussed, among others, in (Chetty and Saez, 2006; Yagan, 2015; Alstadsæter et al., 2017; Schjelderup and Zoutman, 2024)

<sup>16</sup>The eventual change only took place in 2023.

<sup>17</sup>Table A6 of Appendix B.2 does not find any noticeable changes in the uptake of tax professional usage either in 2005 or 2007.

<sup>18</sup>The Dutch tax authorities classify an individual as an ‘entrepreneur’ for income tax purposes if they own and operate a business independently and bear the associated financial risks. As discussed previously, large shareholders such as director-shareholders would generally not be allowed to benefit from the tax cuts granted to ‘entrepreneurs’.

<sup>19</sup>One might assume that the dividend tax cut may have incentivized some taxpayers who previously filed as entrepreneurs to not file as such in 2007. We do not observe any such increases when looking at the share of entrepreneurs in Table A6 of the Appendix B.2.

Table 1: Heterogeneous Effects on Tax Declarations

	Wealth above €100k			Tax professional			Entrepreneur			Male		
	Box 2	other assets	other profits	Box 2	other assets	other profits	Box 2	other assets	other profits	Box 2	other assets	other profits
2005 effect	-2.016 (50.170) [0.968]	82.671*** (31.025) [0.008]	-1.637 (5.516) [0.767]	24.738* (55.270) [0.654]	16.129 (17.356) [0.353]	2.655 (2.646) [0.316]	53.833 (85.615) [0.529]	348.491*** (133.109) [0.009]	-13.585 (10.276) [0.186]	-29.864 (76.502) [0.696]	155.333** (51.009) [0.024]	-1.824 (4.332) [0.674]
2007 effect	-7.148 (44.943) [0.874]	107.367*** (32.546) [0.001]	7.230 (5.541) [0.192]	106.858** (50.496) [0.034]	26.358 (18.963) [0.165]	-0.072 (4.365) [0.987]	1062.132*** (244.583) [0.000]	109.511*** (35.997) [0.002]	12.910 (8.355) [0.122]	588.240*** (102.868) [0.000]	14.179 (40.055) [0.723]	0.910 (2.413) [0.706]
2005 het. effect	4448.388 (4269.562) [0.297]	16313.468** (8043.567) [0.043]	-770.664 (531.002) [0.147]	175.312 (290.218) [0.546]	1360.856** (543.037) [0.012]	-69.297 (41.032) [0.910]	180.304 (132.452) [0.173]	-327.622 (204.254) [0.109]	5.638 (14.212) [0.692]	190.502 (147.699) [0.197]	427.784* (251.380) [0.089]	-22.934 (19.136) [0.231]
2007 het. effect	70543.018*** (14855.808) [0.000]	1793.685 (1114.049) [0.107]	580.846 (394.694) [0.141]	4195.222*** (994.623) [0.000]	470.950*** (147.305) [0.001]	69.960** (31.902) [0.028]	111.439 (388.243) [0.774]	403.364* (220.362) [0.067]	49.714 (38.896) [0.201]	966.012** (461.986) [0.037]	241.500*** (72.647) [0.001]	30.268* (16.037) [0.059]

*Note:* Table displays estimated coefficient with \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ , followed by its standard error, and its p-value. The effects '2005 effect' and '2007 effect' are the effects for the baseline category while '2005 het. effect' and '2007 het. effect' measure the interaction effect with the listed indicator variable: Wealth above €100k, Tax professional (used a tax professional to file), Entrepreneur, Male. Interaction effects '2005 het. effect' and '2007 het. effect' are measured and tested as a deviation from the baseline '2005 effect' and '2007 effect'.

## 6 Conclusion

This paper illustrates how tax return complexities, including loopholes and cross-sectional asset classifications, allow the wealthy to engage in strategic tax evasion and avoidance. By leveraging unique auditing announcements and a temporary dividend tax cut in the Netherlands, we illustrate how taxpayers adapt to audit threats by shifting their declarations strategically. Specifically, our results reveal that targeted audits can prompt taxpayers to adjust declarations across different sections of their tax returns to exploit lower tax rates and minimize exposure.

The findings contribute to a deeper understanding of how wealthy taxpayers respond to both audit risks and tax rate changes, highlighting the critical role of complexity in tax codes in facilitating avoidance behaviours. While simplifying tax codes is a first step in limiting the strategic behaviours described in this paper, the results also underline the need to more clearly delineate, or entirely bundle in one tax category, the categorization of assets with ambiguous distinctions.

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# APPENDIX

## A Dutch tax system and yearly announcements

Since 2001, the Dutch tax system separates tax declarations into three categories, or Boxes, as described in Table A1. About 70% of the Dutch population files taxes yearly and the tax is levied on the income minus any deductibles within each Box. Box 1 relates to wages, profits, social security benefits and pensions. It follows a progressive tax over four tax brackets which in 2005 had cutoffs at €16,893, €30,357 and €51,762. The income in each bracket is taxed at 1.80%, 9.35%, 42% and 52%. For income under €30,357 there is also a 32.60% flat rate for social security contributions. The second category, Box 2, represents income from a substantial business interest which most often denotes a shareholding of at least 5% in a company. Box 2 income is subject to a flat tax of 25%. Finally, Box 3 combines income from savings and investments. The total amount in this Box can be allocated optimally between fiscal partners. Individually declared income in Box 3 over €19,522 is subject to a 30% flat tax which is taken on a fixed assumed return of 4% of the average yearly net value of the assets minus any liabilities.

Table A1: Income Tax in the Netherlands for 2005

Category	Bracket (€)	Tax Rate
<u>Box 1: Income from home and work</u>		
- profits from business or professional activities, income from main employment, income from other activities.	0-30,357 if aged < 65	32.60%
- income in the form of periodic payments (pensions, life annuity).	0-16,893	1.80%
- capital income from owner occupied dwelling and mortgage debt.	16,893-30,357	9.35%
- negative expenses for income provisions, negative personal deduction.	30,357-51,762	42%
- deductions: commuting costs, childcare expenses, other work related expenditures, expenses for income provisions, mortgage debt on home.	51,762-	52%
<u>Box 2: Income from substantial interest</u>		
- dividends and capital gains if taxpayer, either solely or with his or her partner, holds 5% of the issued capital in a company, directly or indirectly <sup>1</sup> .	total share value	25%
<u>Box 3: Income from savings and investments<sup>2</sup></u>		
- bank and savings accounts (national and foreign). - stocks and other shares. - second home. - rental income, interest income and endowment insurance policy (other than that declared in Box 1 and Box 2). - deductions: interest on debt, educational expenses, charitable contributions.	$\max \{ 0, (\text{total} - 19,522) * 4\% \}$	30%

<sup>1</sup> If the fiscal partner of a taxpayer holds a substantial business interest above 5% then any individual shares constitute a substantial interest, even if they do not amount to 5%. For instance, if a taxpayer holds a substantial business interest of 3% and the fiscal partner holds a substantial business interest of 7% then both taxpayers will be taxed at 25%. On the other hand, if one has a holding of 3% and the other has a holding of 4%, neither of them will be taxed in Box 2.

<sup>2</sup> Income in Box 3 can be reallocated between fiscal partners but the final tax is levied on individual declarations.

Anyone liable to pay taxes for year  $t$  in the Netherlands is supposed to fill in their declarations by April 1st of year  $t + 1$ . If people do not send any tax declarations, these are filled in automatically using available third-party information which includes income, property, bank and other financial information. Some components of third party information, such as savings in national banks, are regular while others, such as information on offshore bank accounts, may vary year-to-year depending on international banking agreements. The tax authorities then analyze the tax declarations starting beginning July of year  $t + 1$  and generate audit flags.

Flags are based on some characteristics of the returns, previous flags and differences between declarations and third-party information. It takes some time before the letters are sent out to the people whose tax declarations will be subject to audit. In most years, these letters are sent out between October of year  $t + 1$  and September of year  $t + 2$ .<sup>20</sup> When an auditor detects misreporting, the taxpayer is required to pay the full outstanding sum. If the underreporting is seen as intentional cheating then there can be an additional fine varying between 50%-100% of the evaded value. For underreporting due to negligence, the fine is 25%.

In our analysis we must exclude any intervening effects from other announcements between 2002-2008. This is likely to hold. The 2002 announcement concerned uncommon expenditures and the 2003-2004 announcements concerned pension annuity payments, neither of which overlap with the topics we study. The 2006 announcement concerned a specific type of deductible on mortgage debt for people who sell a house and buy a new one within the same fiscal year. This announcement may overlap slightly with some of the property sub-items targeted in the 2005 and 2007 announcements but, if unaccounted for, would likely lead to an underestimate of our misreporting effects. The influence of the 2006 announcement is unlikely to be large since it affects only a small fraction of house buyers in 2006. The 2008 announcement concerned charitable donations which are separate from the topics we study in Box 1 and Box 3.

## B Descriptive Statistics

The analysis uses longitudinal data from the Netherlands Tax and Customs Administration covering years 2002-2008 and include yearly individual tax declarations. We also observe each taxpayer's gender, age, nationality, whether they had a partner, the number of children, overall income, work sector, whether someone is self-employed, an indicator for whether someone's taxes are filed by tax professionals and the postcode.

Table A2: Declarations by individual characteristics

	Targ. Sample	Repr. Sample
<b>All:</b>	100%	100 %
<b>Gender:</b>		
Female	22.3%	51.2 %
Male	78.7%	49.8 %
<b>Fiscal Partner:</b>		
Single	18.1%	63.9 %
Partner	81.9%	36.1 %
<b>Migrant:</b>		
Dutch	97.5%	95.6 %
Foreign	2.5%	6.3 %
<b>Children:</b>		
0	21.2%	51.9 %
1-2	52.9%	36.9 %
3+	25.9%	11.2 %
<b>Age:</b>		
-30	3%	32.2 %
30-50	49.9%	33.8 %
50-65	37.1%	20.8 %
65+	10%	13.2 %
<i>N</i> ind.	50,147	19,133
<i>N</i> obs.	351,029	133,931

<sup>20</sup>For the 2007 topic, the sample of people due for audit was initially too big to handle. As a result, letters were sent out after mid-April 2009.

We collect data on two samples of taxpayers subject to the subcategories targeted or affected by the 2005 and 2007 announcements. The first group focuses on declarations concerning *profits from assets made available*, the focus of our main analysis. We draw a representative random sample of 50,147 individuals from the pool of taxpayers declaring positive or negative returns in the *profits from assets made available* category over 2002-2008. For each of these taxpayers we then append the tax information for all other years. We also draw a random sample of 19133 taxpayers followed over 2002-2008 for the random sample.

Table A3: Declarations by employment characteristics

	Targ. Sample	Repr. Sample
<b>All:</b>	100%	100%
<b>Total income:</b>		
<0	2.8%	0.9%
0-30,000	28.4%	79.3%
30,000-60,000	35.1%	16.2%
60,000-120,000	22.7%	2.9%
120,000+	10.9%	0.6%
<b>Employment:</b>		
entrepr.	14.2%	5.1%
non- entspr.	85.8%	94.9%
<b>Tax professional:</b>		
no	17.0%	81.6%
yes	83.0%	18.4%
<b>Job sector:</b>		
agricul.	1.9%	1.2%
industry	3.7%	2.4%
instal.	4.1%	5.0%
wholesale	5.5%	3.5%
retail	6.7%	6.6%
trans.-comm.	1.8%	2.2%
bank-fin.	45.7%	12.3%
unknown-unempl.	24.8%	52.3%
none	5.8%	14.7%
<i>N</i> ind.	50,147	19,133
<i>N</i> obs.	351,029	133,931

The *Employment* category omits observations in 2002 since these have no information concerning entrepreneur status. Job sector categories: agricul.=agriculture and fisheries ; industry=industry and mineral extraction; instal=construction, installation and utilities; whole-sale=wholesale and intermediate trade; retail=retail, catering and repair; trans.-comm.=transport, storage and communication; bank-fin.=banking, insurance and business services.

Summary statistics for each sample are presented in Table A2. We show separate statistics for the targeted and representative samples. The first column presents the respective shares of individuals in the targeted sample by individual characteristics. The second column shows these same shares for the representative sample.

Table A3 categorizes declarations by employment characteristics. The entrepreneur category includes people who registered as ‘independent without personnel’ or small firms.<sup>21</sup> Registering as an entrepreneur does not prevent people from being employed for someone else but requires filing taxes as a self-employed.

Table A4 presents the declarations of tax items in other sections of the tax forms for the three samples. For each sample, the first column presents the average yearly declarations of items in

<sup>21</sup>Small firms are those with fewer than 5 employees.

Table A4: Summary statistics (in €)

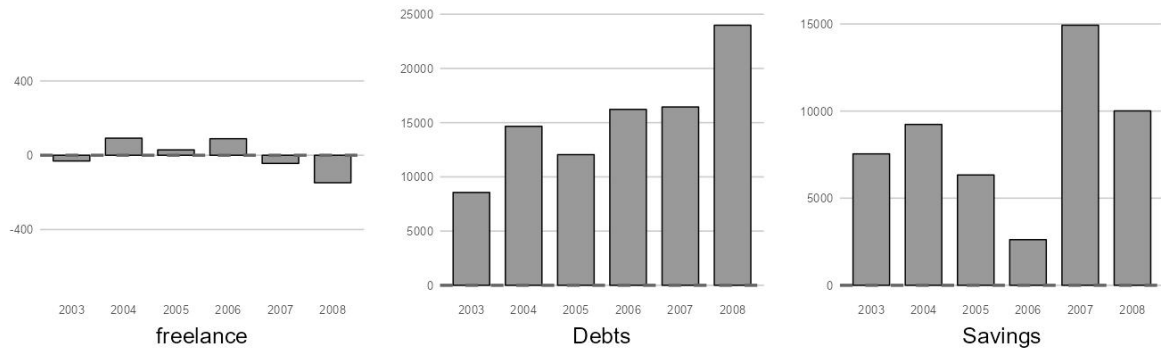
	Targ. sample		Repr. sample	
	avg.	frac.	avg.	frac.
<b>Total</b>	70,733 (228,872)	97.2%	17,138 (35,981)	65%
<b>Box 1 total</b>	46,273 (73,941)	96.4%	15,948 (22,339)	64.4%
freelance	667 (16,562)	6.8%	117 (1,490)	2.8%
other profits	2,711 (41,576)	62.3%	34 (1,704)	0.6%
<b>Box 2 total</b>	15,466 (202,495)	9.7%	507 (24,688)	0.4%
<b>Box 3 total</b>	8,994 (41,434)	53.1%	683 (5,737)	14.3%
other property	16,349 (1,188,623)	28.2%	5,064 (68,034)	2.4%
other assets	8,825 (237,280)	4.9%	466 (16,363)	0.6%
debts	135,192 (1,081,514)	47.2%	4,185 (67,213)	5.6%
shares, bonds, etc.	90,842 (696,930)	35.1%	7,175 (93,688)	7.9%
savings	77,903 (378,735)	61.5%	11,008 (56,390)	16%
other claims & cash	25,014 (280,144)	16.9%	1,522 (32,581)	2.2%
2nd home	16,408 (172,029)	6.7%	1,207 (24,424)	0.9%
capital insurance	2,081 (51,963)	5%	108 (3,514)	0.8%
benefits claims	335 (39,936)	0.3%	8 (676)	0%

Standard deviations in parenthesis. *frac.* represents the average fraction of taxpayers in each sample declaring the the specific tax category over years 2002-2008.

the different Boxes. The second column presents the average yearly share of declarations larger than €100 or lower<sup>22</sup> than -€100 for each item.

## B.1 Additional Descriptive Figures

Figure A1: Yearly changes in average declarations 2002-2008



## B.2 Additional Results

For the log specifications, we impute a minimum value of 1000 to declarations between 0 and 1000 in order to avoid large leverage from changes of individuals at the lower end of the wealth distribution. As such, results from the log specification will be more informative about responses for taxpayers in the middle of the wealth distribution.

<sup>22</sup>The topics that can be negative are Box 1, Box 2, IFW, PAA and savings. If the subtopics in Box 3 sum up to a negative amount, the overall declaration is set to 0.

Figure A2: Targeted sample declaration effects (in logs) in 2005 and 2007

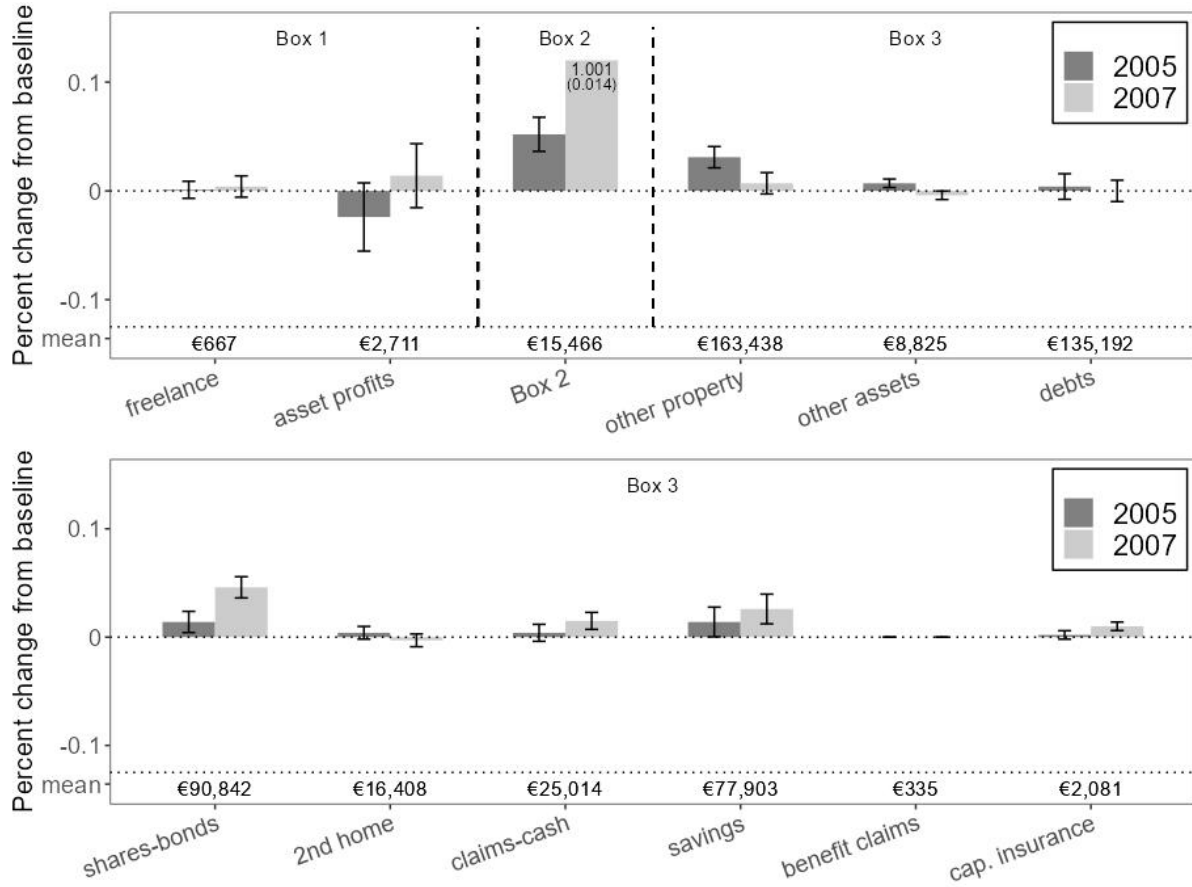


Figure A3: Representative sample declaration effects (in logs) in 2005 and 2007

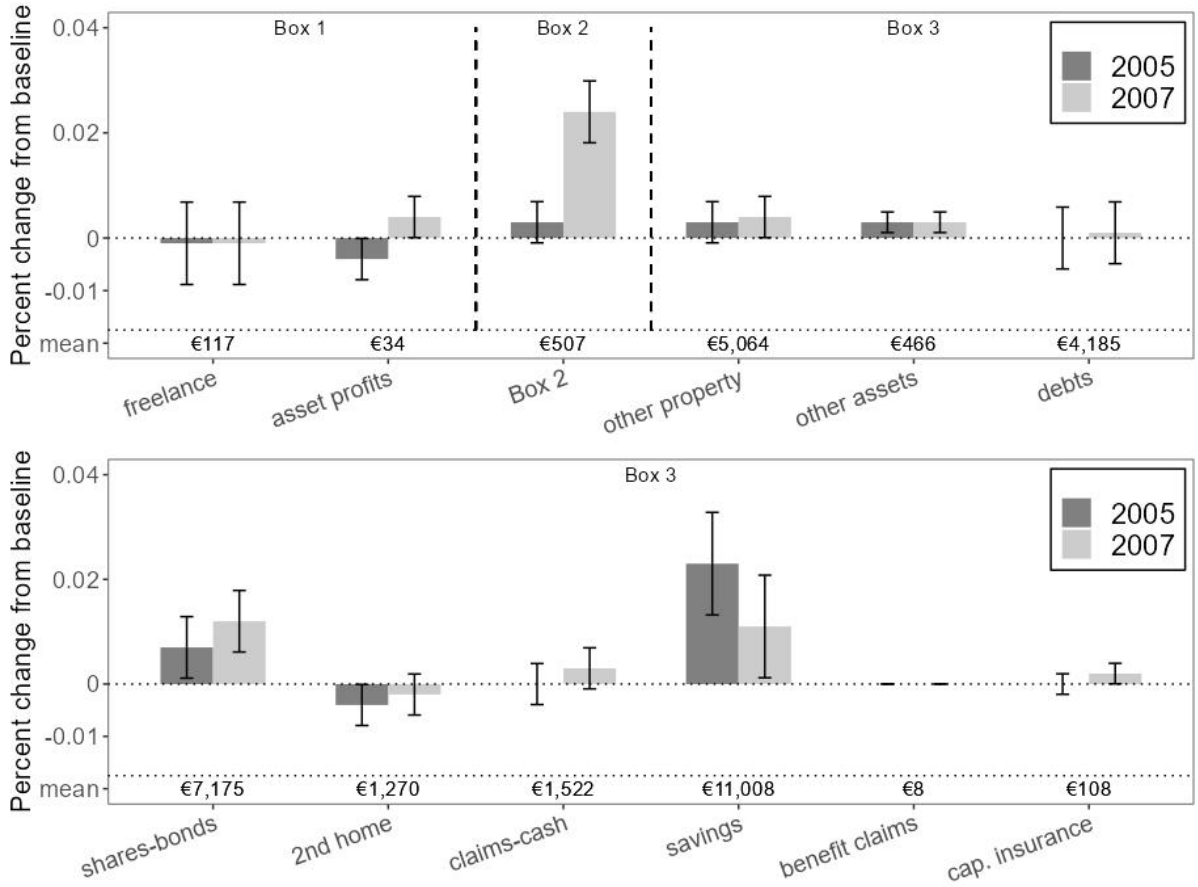




Table A5: Targeted sample: Fraction of Positive, Zero, and Negative Instances by Category and Year

<b>Category</b>		<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Freelance</b>	Positive	0.06	0.06	0.06	0.06	0.07	0.07	0.06
	Zero	0.93	0.93	0.93	0.93	0.93	0.93	0.93
	Negative	0.00	0.00	0.01	0.00	0.00	0.00	0.00
<b>Asset Profits</b>	Positive	0.50	0.55	0.58	0.60	0.59	0.57	0.53
	Zero	0.44	0.38	0.35	0.34	0.35	0.37	0.41
	Negative	0.07	0.07	0.07	0.06	0.06	0.06	0.06
<b>Box 2</b>	Positive	0.07	0.06	0.07	0.06	0.05	0.19	0.07
	Zero	0.92	0.92	0.92	0.92	0.94	0.80	0.92
	Negative	0.01	0.02	0.02	0.02	0.02	0.01	0.02
<b>Other Property</b>	Positive	0.25	0.26	0.27	0.29	0.30	0.30	0.31
	Zero	0.75	0.74	0.73	0.71	0.70	0.70	0.69
<b>Other Assets</b>	Positive	0.04	0.04	0.05	0.05	0.05	0.05	0.06
	Zero	0.96	0.96	0.95	0.95	0.95	0.95	0.94
<b>Debts</b>	Positive	0.36	0.36	0.41	0.44	0.54	0.60	0.60
	Zero	0.64	0.64	0.59	0.56	0.46	0.40	0.40
<b>Shares-Bonds</b>	Positive	0.35	0.34	0.36	0.36	0.36	0.35	0.34
	Zero	0.65	0.66	0.64	0.64	0.64	0.65	0.66
<b>Savings</b>	Positive	0.56	0.55	0.62	0.63	0.63	0.64	0.65
	Zero	0.44	0.44	0.38	0.37	0.37	0.35	0.35
	Negative	0.01	0.00	0.00	0.00	0.00	0.00	0.00
<b>Tax Advisor</b>	Positive	0.62	0.82	0.86	0.86	0.88	0.88	0.88
	Zero	0.38	0.18	0.14	0.14	0.12	0.12	0.12
<b>Entrepreneur</b>	Positive	NA	0.25	0.17	0.17	0.15	0.13	0.12
	Zero	1.00	0.75	0.83	0.83	0.85	0.87	0.88

Table A6: Representative sample: Fraction of Positive, Zero, and Negative Instances by Category and Year (2002–2008)

<b>Category</b>		<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Freelance</b>	Positive	0.02	0.02	0.02	0.03	0.03	0.03	0.03
	Zero	0.98	0.98	0.98	0.97	0.97	0.97	0.96
	Negative	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Asset Profits</b>	Positive	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Zero	0.99	0.99	0.99	0.99	0.99	0.99	0.99
	Negative	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Box 2</b>	Positive	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	Zero	1.00	1.00	1.00	1.00	1.00	0.99	1.00
	Negative	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Other Property</b>	Positive	0.02	0.02	0.02	0.02	0.02	0.03	0.03
	Zero	0.98	0.98	0.98	0.98	0.97	0.97	0.97
<b>Other Assets</b>	Positive	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Zero	0.99	0.99	0.99	0.99	0.99	0.99	0.99
<b>Debts</b>	Positive	0.04	0.04	0.04	0.04	0.07	0.08	0.08
	Zero	0.96	0.96	0.96	0.96	0.93	0.92	0.92
<b>Shares-Bonds</b>	Positive	0.09	0.07	0.08	0.08	0.08	0.08	0.07
	Zero	0.91	0.93	0.92	0.92	0.92	0.92	0.93
<b>Savings</b>	Positive	0.16	0.13	0.14	0.16	0.17	0.17	0.18
	Zero	0.84	0.87	0.86	0.84	0.83	0.83	0.82
	Negative	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Tax Advisor</b>	Positive	0.09	0.16	0.18	0.19	0.21	0.23	0.24
	Zero	0.91	0.84	0.82	0.81	0.79	0.77	0.76
<b>Entrepreneur</b>	Positive	NA	0.06	0.06	0.06	0.06	0.06	0.06
	Zero	1.00	0.94	0.94	0.94	0.94	0.94	0.94