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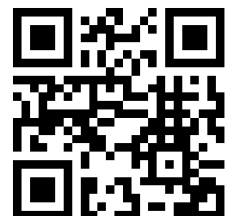
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# CAN INCREASED TAX TRANSPARENCY CURB CORPORATE TAX AVOIDANCE?\*

Michael Razen<sup>†</sup>  
Alexander Kupfer<sup>‡</sup>

March 24, 2021

## Abstract

Tax avoidance among large multinational corporations has considerably increased in recent years, triggering an intense discussion about how to ensure tax justice. We propose a novel experimental design to incentive-compatibly model the firm-consumer relationship in a consumer goods market. This new paradigm allows us to analyze the effect of increased tax transparency on consumer and firm behavior in a dynamic framework. We find that absent the threat of being exposed as a tax avoiding firm, only 26% of the firms decide to pay taxes. Once tax avoiding firms are identifiable in the market, this rate rises to 58%. Providing market participants additionally with information about the social costs of tax avoidance increases the fraction of tax paying firms further to 74%. We show that these improvements are the consequence of firms proactively adopting tax responsible behavior and, at the highest level of transparency, consumers showing a stronger proclivity to boycott tax avoiding firms, even if these firms offer cheaper prices. Our results confirm the effectiveness of increased transparency to curb corporate tax avoidance.

## Keywords:

economic experiment, tax avoidance, public good dilemma, consumer behavior, firm behavior

## JEL codes:

C9, C92, H26

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# 1 Introduction

*'It's only outrage that will stop the system.'*

Joseph Stiglitz at World Economic Forum 2018

talking about corporate tax avoidance

In recent years, numerous news reports have brought to light the extent to which multinational corporations apply aggressive tax planning to minimize their tax burden. These tax optimization strategies are not prohibited by law, but rely on exploiting a wide range of legal loopholes (Fuest et al., 2013, European Commission, 2015 and European Commission, 2017). Tentative estimations of the resulting global shortfalls in tax revenues range from 100 billion to 500 billion US-Dollars (Crivelli et al., 2015 and OECD, 2015). Moreover, aggressive tax planning might further cause inordinate tax competition among countries, leading to an unsustainable 'race to the bottom' of corporate tax rates (Devereux et al., 2008, Genschel et al., 2011 and Overesch and Rincke, 2011). Proposed measures initiated by the OECD to counter aggressive tax planning practices focus on establishing further international tax rules and efforts to intensify coordination among international tax authorities (OECD, 2013a and OECD, 2013b). While it is assumed that these initiatives could indeed moderate tax avoidance of multinational corporations (Evers et al., 2016), they require arduous negotiations between policy makers worldwide and might still leave some countries with incentives to deviate from the agreed upon policies (Genschel and Schwarz, 2011 and Fuest and Sultan, 2019). As an alternative, increased tax transparency and resulting public pressure are also conjectured to promote tax responsibility among competing firms (Dyreng et al., 2016). While an advantage of this approach is that it requires less regulatory interventions and does not depend on possibly fragile international legal coordination, empirical evidence is needed to assess its effectiveness. Particularly, the potential dynamics between consumers and firms as a result of increased tax transparency is unexplored to this point and is hence a focus of the present paper.

Existing research on corporate tax avoidance identifies a tradeoff between the costs and the value of tax avoidance. While its value is obvious (lower tax payments), the costs are typically weighed in terms of reputational damage in the view of consumers and other stakeholders. For instance, Desai and Hines (2002) and Hanlon and Slemrod (2009) analyze the reaction of firms' share prices when information about their tax avoiding behavior is disclosed, as a proxy for the overall assessment of investors. The findings, however, are inconclusive: Hanlon and Slemrod (2009) observe negative reactions on share prices, while Desai and Hines (2002) find a positive reaction. The study by Hanlon and Slemrod (2009) further differentiates between more consumer-orientated industries and less consumer-orientated industries, observing that share prices decrease more for consumer-related industries. This indicates that consumers' opinion on the reputation of a firm seems to be considered

as relevant by investors. Further, Hanlon and Heitzman (2010) call for research that explicitly examines consumers' reactions. Taking a step in this direction, Hoopes et al. (2018) make use of Australia's policy to disclose detailed information on tax returns of private and public firms. Their study also examines how consumer sentiment on these firms is affected when their tax information is released. While the authors find no effect of public disclosure on consumer sentiment for large international corporations, there is some consumer backlash for relatively smaller firms. The authors hypothesize that tax disclosure may matter for consumer sentiment, yet that the corresponding information might not be new for firms with large, influential brands.

In light of the difficulty to isolate potential effects with respect to consumer behavior, some studies use an experimental approach. In the survey-based work by Hardeck and Hertl (2014), participants take on the role of consumers and are asked about their purchase intention and willingness to pay for a certain product. In two treatments, they are presented with either neutral information or media reports on tax avoidance about the corresponding firm. The study finds evidence that both purchase intention and willingness to pay is lower when the firm engages in aggressive tax planning. Taking a similar approach, Antonetti and Anesa (2017) investigate whether consumers' political ideology is a potential mediator for consumer reaction. Their main results also suggest that aggressive tax avoidance lower consumers' purchase intentions. In addition, the authors find that right-leaning consumers punish aggressive tax avoiding behavior less than left-leaning consumers do. Asay et al. (2018) analyze both consumers' purchase intention and actual choice in a simple decision setting. After reading background information about two firms, participants received an additional news article about one firm avoiding taxes. They were then asked to indicate whether they would buy products from the two firms (purchase intention), and could also choose between (equally valued) gift cards from either of the firms (consumer choice). Participants' answers were then compared to a control group who received the same background information on the firms, but without the additional news article about one firm avoiding taxes. Consumers in the former treatment showed lower purchase intention and were less likely to choose the gift card of the tax avoiding firm. While the choices in the above studies were not incentivized in the narrow sense, Hardeck et al. (2019) elicit subjects' actual willingness to pay for a certain good (a pen) using the mechanism suggested by Becker et al. (1964). Interestingly, they find no direct effect of tax avoidance on willingness to pay. In a non-incentivized question on the attitude towards the firm, however, tax avoiding firms are perceived more negatively than a firm with a neutral description.

Taken together, the above findings indicate that tax avoidance can indeed cause reputational damage, yet it is unclear whether consumers are willing to sanction tax avoiding firms if it comes at a cost. Aside from the inconclusive results on willingness to pay, in all of the above settings firms

are modelled as exogenous and unresponsive entities. As a consequence, these frameworks do not allow to study the *behavioral dynamics* between consumers and firms. However, this is a crucial element of their relationship: Consumers have the possibility to discipline firms and thereby enforce a socially more desired behavior by boycotting tax avoiding firms. Hence, incorporating this feature of consumer markets is key to studying the effect of tax transparency on corporate tax avoidance. In this paper, we present a novel and simple experimental paradigm that allows to analyze these market dynamics in the presence of taxes. In particular, we formulate the following research questions:

- RQ1: What is the effect of tax transparency on corporate tax morale?
- RQ2: Are consumers willing to actively sanction tax avoiding firms?
- RQ3: Does increased tax transparency increase social welfare?

To answer these research questions, we propose an experimental consumer market where firms subject to tax payments interact with consumers in a market for a standardized consumption good. To align subjects' incentives with real world analogues, firms are paid corresponding to their profits, while consumers are paid corresponding to their consumption. Moreover, tax revenues are increased by a fixed multiplier and evenly redistributed to all market participants. Some firms, however, can choose to avoid taxes. This design captures the public good dilemma generally inherent in taxation systems: From an individual point of view, firms who avoid taxes can charge lower prices to gain market shares as well as increase profit margins, and consumers buying from cheaper (tax avoiding) firms can purchase a higher quantity of the consumption good. From a societal of view, however, avoiding tax payments means a decrease in the provision of public goods, lowering overall social welfare. To examine whether tax transparency can resolve this dilemma (as conjectured by, e.g., Dyreng et al., 2016), we conduct three treatment variations where we gradually increase the amount of publicly available information. In the BASELINE treatment, no information on tax avoidance is disclosed. In the IDENTIFICATION and the TRANSPARENCY treatment, all market participants are informed which firms are avoiding taxes in the current period on their trading screens. In the TRANSPARENCY treatment, the summary screens additionally include information about (i) the aggregated revenue of tax avoiding firms, (ii) the resulting total loss in tax income and (iii) the individual loss in tax income.

We find a substantial effect of tax transparency on tax morale, consumer sanctioning and social welfare. Decision rates to pay taxes increase from 26% in treatment BASELINE to 58% in IDENTIFICATION and 74% in TRANSPARENCY. Analyzing the dynamics that drive these results, we find that the effect of increased transparency is twofold. First, firms exhibit a higher inclination to pay taxes right from the start, even before interacting with consumers on the market.

Second, we observe that at the highest level of transparency, consumers show a stronger proclivity to boycott tax avoiding firms, even if these firms offer cheaper prices. Finally, we report a substantial and significant increase in welfare in IDENTIFICATION and TRANSPARENCY compared to the BASELINE treatment. Our findings thus support the hypothesis that promoting tax transparency can both improve corporate tax morale and increase social welfare.

As this study is, to the best of our knowledge, the first to analyze corporate tax avoidance in a dynamic setting where consumers and firms interact over several periods in the same market, we contribute to the existing literature along the following three dimensions. First, as outlined above, allowing for an interaction between consumers and firms is an important feature to test whether consumers are actually willing to sanction tax avoiding firms. So far, the answer to this question remained unclear, as previous studies observed different responses in hypothetical and incentivized settings. This difference could either indicate that consumers are not willing to sanction tax avoiding firms if it is costly, *or* simply be the result of subjects realizing that their choice in the static incentivized setting has no effect on the behavior of the firm. We contribute by showing that consumers are indeed willing to sanction tax avoiding firms in a dynamic framework when they are informed about the consequences of corporate tax avoidance.

Second, we also contribute methodologically by proposing a framework that adequately reflects the social dilemma posed by corporate taxes in the firm-consumer-relationship. We thereby significantly add to the experimental economics literature, which has been centering around *individual* tax behavior of homogeneous agents (see, e.g., Alm and Malézieux (2020)'s meta-analysis).<sup>1</sup> A distinct characteristic of the firm-consumer-relationship, however, is the fact that each individual consumer has an *incentive to support tax avoiding behavior*, as they benefit from the lower prices that tax avoiding firms can offer. Traditional tax and public good games fall short of capturing this aspect. Aside from the tax aspect, our design can also serve as a general incentive-compatible workhorse for experimental studies on consumer goods markets.

Third, from a policy perspective, we contribute by examining the efficiency of tax transparency as a measure to curb corporate tax avoidance and its effect on social welfare. While it has been established that recognizing contributors in public good games does increase contribution rates (see, e.g., Samek and Sheremeta, 2014), prior literature cannot answer whether this is also the case when the interdependence is more complex, i.e., if those who refuse to contribute can make use of their decision to offer monetary benefits to beguile their potential punishers. We find that increased tax transparency improves both tax morale of firms and overall social welfare. Our results also indicate

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<sup>1</sup> In these 'tax evasion games', as the authors call them, subjects receive an initial income that is subject to taxes. Subjects can then decide on the actual income they report which will determine the size of their tax payment. However, underreporting comes with the threat of fines in case of being detected. While this strand of literature thus studies (illegal) *tax evasion among individuals*, we address (non-illegal, but socially undesirable) *tax avoidance among firms*.



that learning about the effects of corporate tax avoidance serves as catalyst for this improvement. Hence, we argue that proposed measures such as country-by-country reporting could be effectively supported by informing consumers about the individual and quantified consequences of corporate tax avoidance.

The rest of this paper is organized as follows. In Section 2 we outline the experimental design and protocol. Section 3, presents and discusses the results, and Section 4 concludes.

## 2 Experimental Design

In total, 144 subjects (bachelor and master students of all disciplines) participated in the study. Subjects were recruited via hroot (Bock et al., 2014) and randomly assigned to one of the three treatments. The experiment was conducted using z-Tree (Fischbacher, 2007) and GIMS (Palan, 2015). Instructions were distributed at the beginning of the experiment and control questions ensured that all participants understood the experiment. Payments ranged from 9.4 to 17.6 Euro with an average of 14.3 Euro. We ran six markets per treatment with each market being composed of four consumers and four firms. Trading took place during 10 periods lasting two minutes each.

The experimental protocol was organized as follows. At the beginning of each period, consumers receive an income of 1,200 experimental currency units ('Taler') which they can use to buy the consumption good from the firms. The firms act as retail sellers who can buy the consumption good at a fixed price of 200 Taler and resell it to the consumers in the market. Consumers' income and the firms' cost of purchasing the product are not disclosed to the other group.

Figures 1 and 2 depict the market view for firms and consumers, respectively.<sup>2</sup> To engage in the market, firms announce the price at which they are willing to resell the good. To prevent a single firm from flooding the market, firms can only offer one unit of the good at a time. The offers along with the corresponding firms' label (ID) are visible to all market participants on their trading screens. Consumers can freely choose from the available offers. If a consumer accepts an outstanding offer, they receive one unit of the good in exchange for the corresponding Taler price. Whenever a firm sells a product, it has to pay 20 percent of the corresponding revenues as taxes. The firm's profit is thus calculated as the resale price minus a tax of 20%, minus the purchasing price of 200 Taler.<sup>3</sup> Accounting for firms' different financial and legal resources, only half of the firms are given the opportunity to decide whether they want to avoid taxes prior to each period (discretionary tax payers) while the other half has no such option (mandatory tax payers). At the end of each period,

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<sup>2</sup> The figures show the screens for treatments IDENTIFICATION and TRANSPARENCY. In the BASELINE treatment, there is no information on tax avoiding firms. For more details on the instructions, see the Appendix.

<sup>3</sup> To facilitate computations, firms are provided with a profit calculator where they can enter a desired price and then directly see the resulting profit.

tax revenues are increased by a fixed multiplier of five and then evenly redistributed to all market participants. Finally, summary screens displaying the individual number of transactions, individual earnings, overall tax income and individual tax income are provided after each period.

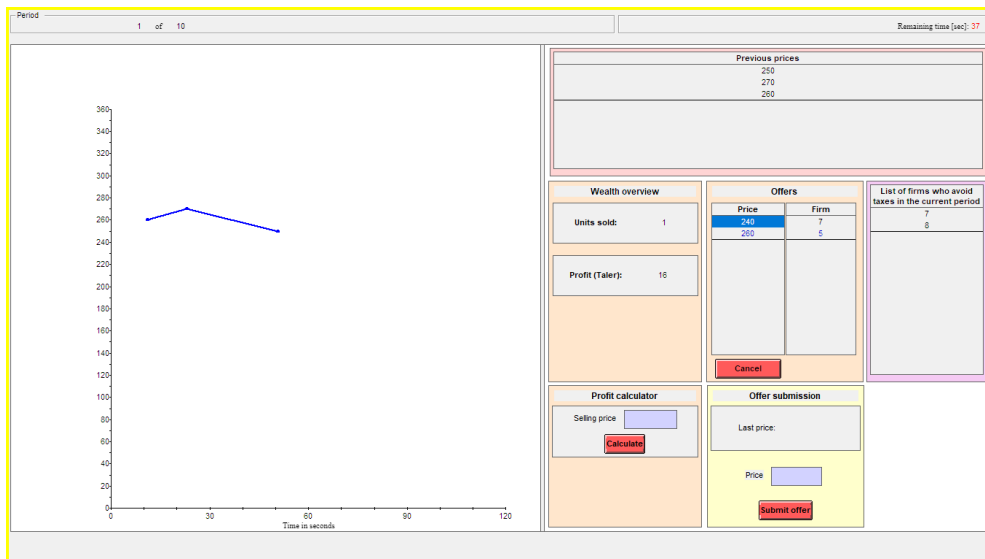


Figure 1: Firm view

Market view for firms. The cockpit shows prior prices, an overview of the firm's own transactions and profits, current offers, a list of the tax avoiding firms in the current period (treatments IDENTIFICATION and TRANSPARENCY only), a profit calculator (net profit based on sales price), and a panel to enter new offers.

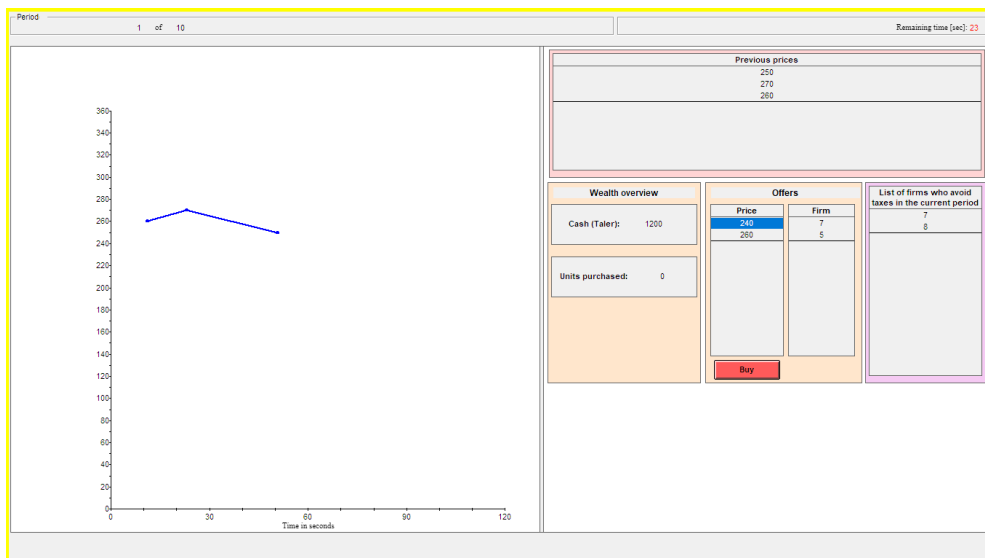


Figure 2: Consumer view

Market view for consumers. The cockpit shows prior prices, an overview of the consumer's own wealth and purchases, current offers the consumer can choose from, and a list of the tax avoiding firms in the current period (treatments IDENTIFICATION and TRANSPARENCY only).

To ensure a simple and realistic incentivization scheme, the consumers' Euro payoff depends on their consumption (unused Taler income forfeits at the end of each period), while the firms' Euro payoff depends on their Taler profits. Consumers obtain 20 Eurocents for each unit of the consumption good they bought, while firms' Taler profits are converted to Eurocents at an exchange rate of 10:1. In addition to their respective incomes, each subjects' Taler income from tax revenues is converted at the same exchange rate of 10:1.

We run three treatments with varying degrees of publicly available information to analyze the effect of increased tax transparency on the behavior of firms and consumers. In the BASELINE treatment, no information on tax avoidance is provided. This treatment serves as a benchmark for the intensity of tax avoidance when firms do not have to fear reputational downsides of their tax choices.

In contrast, in the IDENTIFICATION treatment, market participants are informed which firms avoid taxes in the current period, which provides the opportunity to study how firms and consumers behave in the dilemma stated above. On the firm side, Graham et al. (2014) present survey evidence that corporate tax executives do factor in reputational concerns as a reason to not adopt tax planning strategies. Austin and Wilson (2017) find that firms with valuable brands avoid aggressive tax planning, which the authors attribute to managers' concerns over reputational costs. At the same time, they argue that 'the existing literature has yet to provide evidence that firms actually incur reputational costs as a result of tax avoidance'. As outlined above, our proposed framework also enables tax avoiding firms to undercut the sales prices of tax paying firms, thus making boycotts of tax avoiding firms potentially costly for consumers. We consider this a key feature for a more realistic interplay of firms' tax decisions, reputational concerns and actual consumer sanctioning.

Given the implicit nature of the welfare losses caused by tax avoidance and the explicit nature of the consumption losses caused by boycotting tax avoiding firms, we conjecture that the tax dilemma might still have a strong impact in the IDENTIFICATION treatment. We thus conduct a third treatment where we further increase transparency by providing market participants with a summary of the social and individual losses caused by tax avoidance at the end of each period. With this TRANSPARENCY treatment, we seek to analyze whether publishing the implicit costs of corporate tax avoidance can act as a catalyst to improve the societal outcome.

Summing up, we gradually increase the amount of publicly available information across treatments to study the effect of tax transparency on firm and consumer behavior. In the BASELINE treatment, no information on corporate tax avoidance is disclosed. In the IDENTIFICATION and the TRANSPARENCY treatment, all market participants are informed which firms are avoiding taxes in the current period on their trading screens. In the TRANSPARENCY treatment, the summary

screens additionally include information about (i) the aggregated revenue of tax avoiding firms, (ii) the resulting total loss in tax income and (iii) the individual loss in tax income. Table 1 gives an overview of the experimental design. Following the literature, we also elicited gender, political view, and competitiveness as control variables at the end of the experiment (see, e.g., Antonetti and Anesa, 2017 and Gao et al., 2019).<sup>4</sup>

Table 1: TREATMENT DESIGN

Treatment	BASELINE	IDENTIFICATION	TRANSPARENCY
Consumers	4	4	4
Firms (Mandatory/discretionary tax payers)	4 (2/2)	4 (2/2)	4 (2/2)
Identification of tax avoiding firms	No	Yes	Yes
Information on losses in tax income	No	No	Yes
Number of markets	6	6	6

Overview of market structure and level of tax transparency in each treatment. Discretionary tax payers can choose whether they wish to avoid taxes while mandatory tax payers have no such option. In the IDENTIFICATION and the TRANSPARENCY treatment, market participants are informed which firms are avoiding taxes in the current period on their trading screens. In the TRANSPARENCY treatment, participants additionally receive summarized information on the losses in tax income due to tax avoidance at the end of each period.

### 3 Results

#### 3.1 Firms' overall tax morale

We first analyze how the disclosure of information on tax avoidance affects firms' tax morale. In our experiment, prior to each period, discretionary tax payers can decide whether they pay taxes in the upcoming trading period. Hence, with two discretionary tax payers per market, 10 periods per market and six markets per treatment, there are 120 tax decisions per treatment. In the BASELINE treatment, which represents an economy that provides no information on tax avoidance, we observe that firms decide to pay taxes in only 31 cases (i.e., 26% of tax decisions). Put differently, without the threat of being exposed, firms decide to avoid taxes in almost three quarters of all decisions. When the information about the firms who have chosen to avoid taxes in the current period is publicly disclosed (treatment IDENTIFICATION), the number of tax paying decisions increases to 70 (i.e., 58%). Finally, when market participants are also informed about the losses caused by tax avoidance (treatment TRANSPARENCY), firms decide to pay taxes in 89 out of 120 cases (i.e., 74%). Figure 3 shows the composition of the market for each treatment (as outlined in Section 2, to emulate different financial and legal resources, half of the firms do not have the opportunity to pay taxes).

In Table 2, we provide the results of a logistic regression with the firms' tax decision (0 = do not

<sup>4</sup> The corresponding questions are: 'What is your political view?' on a scale from 0 'Left' to 10 'Right' and 'How much do you agree with the following statement: It is important to me to perform better than others.' on a scale from 0 'Strongly disagree' to 10 'Strongly agree'.

pay taxes, 1 = pay taxes) as the dependent variable. Column 1 confirms that firms in both the IDENTIFICATION and TRANSPARENCY treatment exhibit significantly higher tax morale than those in the BASELINE treatment ( $p < 0.05$  and  $p < 0.01$ ). The difference between IDENTIFICATION and TRANSPARENCY is not significant. These results are robust when controlling for gender, political view, and competitiveness (Column 2). Here, we find that competitiveness negatively correlates with tax morale.

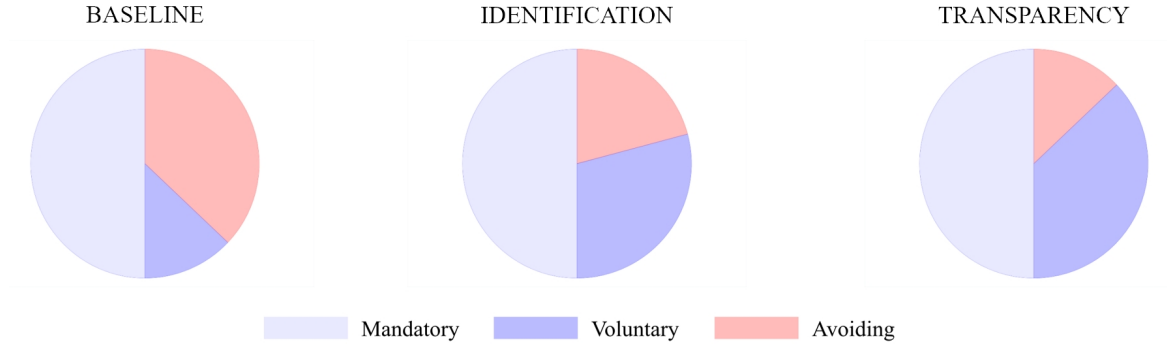


Figure 3: Market share in terms of market composition.

Market shares of tax paying and tax avoiding firms in terms of market composition. In all treatments, 50% of the firms have no opportunity to avoid taxes (Mandatory). The other 50% of the firms can decide whether they choose to pay taxes (Voluntary) or not (Avoiding). In BASELINE, 37% of all firms avoid taxes (left graph). In IDENTIFICATION, the fraction of tax avoiding firms drops to 21%. In TRANSPARENCY, only 13% of all firms avoid taxes.

Table 2: FIRMS' OVERALL TAX MORALE

<i>Dep. Var.: Pay taxes</i>	(1)	(2)
IDENTIFICATION	1.391** (0.570)	2.223*** (0.612)
TRANSPARENCY	2.109*** (0.578)	3.079*** (0.530)
Female		0.673 (0.472)
Political view		-0.153 (0.112)
Competitiveness		-0.244** (0.110)
Observations	360	360
$R^2$	0.122	0.224
TRANSPARENCY – IDENTIFICATION	0.718 (0.613)	0.857 (0.544)

Logistic regression of the firm's decision to pay taxes (0: no, 1: yes) on treatment dummy variables, with BASELINE as the reference category. Control variables are gender, political view (0: left, 10: right) and competitiveness (0: low, 10: high). Standard errors are provided in parenthesis (clustered at firm level). Goodness of fit is measured as Pseudo- $R^2$ . The last row shows the treatment effect between TRANSPARENCY and IDENTIFICATION. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

### 3.2 Firms' initial tax morale

We next turn to the question what motivates firms to display increased tax morale in the treatments with higher transparency. As tax transparency enables consumers to sanction tax avoiding firms, we analyze whether firms already act upon *anticipated* consumer sanctioning or whether they only react to *experienced* boycotts of consumers. To address the first channel, we study the choices of the discretionary tax payers before the first period, as these decisions are made prior to any interactions with the consumers. Hence, any differences in tax decisions across treatments can only arise due to differences in the (announced) degree of publicly available information. Estimating the same logistic regression as above for the decisions before the first period only, we also observe a significantly positive effect ( $p < 0.05$  for IDENTIFICATION,  $p < 0.01$  for TRANSPARENCY) of tax transparency on tax morale (Table 3). This result indicates that higher transparency and hence potential future sanctioning already creates a credible threat for the firms and thus reduces corporate tax avoidance.

Table 3: FIRMS' INITIAL TAX MORALE

<i>Dep. Var.: Pay taxes</i>	(1)	(2)
IDENTIFICATION	2.303** (0.987)	3.845** (1.578)
TRANSPARENCY	4.007*** (1.300)	5.914*** (1.910)
Female		1.263 (1.303)
Political view		-0.255 (0.268)
Competitiveness		-0.271 (0.269)
Observations	36	36
$R^2$	0.326	0.458
TRANSPARENCY – IDENTIFICATION	1.705 (1.211)	2.069 (1.339)

Logistic regression of the firm's decision to pay taxes (0: no, 1: yes) on treatment dummy variables, with BASELINE as the reference category. Control variables are gender, political view (0: left, 10: right) and competitiveness (0: low, 10: high). Standard errors are provided in parenthesis. Goodness of fit is measured as Pseudo- $R^2$ . The last row shows the treatment effect between TRANSPARENCY and IDENTIFICATION. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

### 3.3 Consumer sanctioning

To address the second channel, we analyze whether consumers do indeed adjust their buying behavior under regimes with higher tax transparency. Since consumers can freely choose the firm they want to buy from, they also have the possibility to sanction tax avoiding firms by refusing to accept their offers. Formalizing this notion, for those periods where at least one firm avoids taxes, we define consumer sanctions as purchases from more expensive tax paying firms while passing by better outstanding offers from tax avoiding firms.<sup>5</sup> The dependent variable in Table 4 is thus the number of sanctions by the consumer in a given period.

Remarkably, we observe a significant increase in consumer sanctioning in the TRANSPARENCY treatment ( $p < 0.05$ ), but not in the IDENTIFICATION treatment ( $p > 0.10$ ). Comparing the two treatments directly, we also find significantly more sanctioning in the TRANSPARENCY treatment ( $p < 0.05$ ). We believe this to be an important observation. It seems that making tax avoiders easily identifiable in the market alone does not alter consumer behavior. However, if consumers are also informed about the costs of corporate tax avoidance, they do factor in whether the seller pays taxes when making their buying decisions.

Table 4: CONSUMER SANCTIONING

<i>Dep. Var.: Consumer sanctioning</i>	(1)	(2)
IDENTIFICATION	0.013 (0.135)	0.017 (0.141)
TRANSPARENCY	0.685** (0.323)	0.684** (0.321)
Female		0.017 (0.176)
Political view		0.008 (0.031)
Competitiveness		-0.007 (0.028)
Observations	504	504
$R^2$	0.054	0.059
TRANSPARENCY – IDENTIFICATION	0.672** (0.323)	0.667** (0.321)

Ordinary least squares regression with active consumer sanctioning per consumer and period as dependent variable. Only periods with at least one tax avoiding firm are considered (periods where all firms pay taxes by definition preclude the possibility to sanction tax avoiding firms). Control variables are gender, political view (0: left, 10: right) and competitiveness (0: low, 10: high). Standard errors are provided in parenthesis (clustered at consumer level). Goodness of fit is measured as  $R^2$ . The last row shows the treatment effect between TRANSPARENCY and IDENTIFICATION. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

<sup>5</sup> As opposed to tax morale, this measure takes on the consumer’s view. We hence count the number of firms a consumer boycotts with the corresponding purchase. I.e., if a consumer forgoes two cheaper offers from tax avoiding firms, we count this as two incidents of sanctioning. As a robustness check, we also performed the subsequent analysis counting the above example as only one incident of sanctioning. Results remain unchanged.

### 3.4 Market and welfare aspects

So far, our analysis has focused on the effects of higher tax transparency on individual decisions of firms and consumers. In this section, we examine the implications on both market and societal level. The effects on individual behavior we observed in the previous sections is also reflected in market shares of tax avoiding firms. Figure 4 contrasts the revenue distributions of tax paying and tax avoiding firms (aggregated) in each of the treatments. The histograms show a considerable decline in market shares of tax avoiding firms that comes with increased tax transparency from 55% in BASELINE through 33% in IDENTIFICATION to 20% in TRANSPARENCY. This further confirms that tax transparency can indeed push back tax avoiding firms.



Figure 4: Distribution of overall revenues.

Revenue distribution in each treatment for tax paying firms and tax avoiding firms, respectively. The blue (light) histograms show the revenues of all tax paying firms, while the red (dark) histograms show the revenues of the tax avoiding firms. In BASELINE, tax avoiding firms account for 55% of the overall revenue (left graph). In IDENTIFICATION, tax avoiding firms generate 33% of the overall revenue. In TRANSPARENCY, the revenue of firms that avoid taxes declines to 20%.

Next, we examine treatment effects on social welfare. While it is trivial that the total (Taler) tax income increases with improving tax morale, the *total Euro income* of all market participants provides a more informative measure of social welfare: It represents the total wealth generated in the economy, including the gains from trade (for both firms and consumers) and thus the efficiency of the market. Figure 5 shows the average total Euro income per period in each of the treatments. We find that increasing tax transparency also improves social welfare. Average payouts per period are 6.08 Euro in BASELINE, 6.63 Euro in IDENTIFICATION and 7.15 Euro in the TRANSPARENCY treatment, respectively. The treatment effects hence amount to an increase in welfare of 9% and 17%, respectively. Pairwise t-tests confirm that all treatment differences are statistically significant.



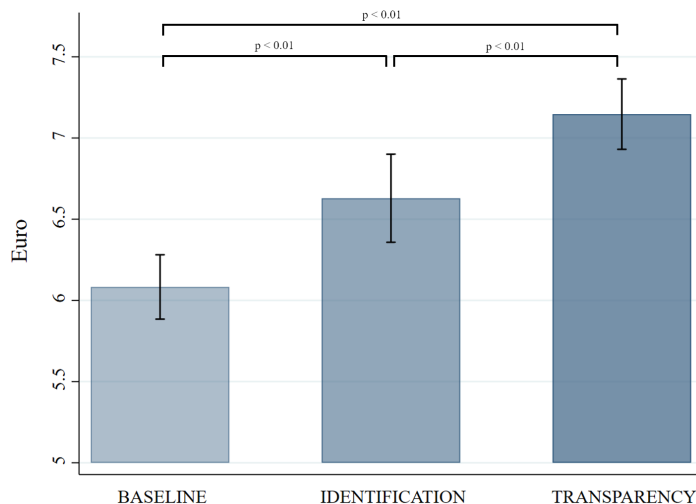


Figure 5: Social welfare.

Average social welfare generated per period in each of the treatments. Welfare increases from 6.08 Euro in BASELINE to 6.63 Euro in IDENTIFICATION and 7.15 Euro in TRANSPARENCY. Error bars indicate 95%-confidence intervals. Horizontal brackets show p-values of pairwise t-tests ( $N = 60$  per treatment).

## 4 Discussion

In this paper, we present a novel experimental design to study corporate tax avoidance. Our setup – which can also be utilized as a general, incentive-compatible framework for consumer goods markets – allows for a dynamic interaction between firms and consumers, where corporate tax avoidance is neither illegal nor exogenously punished. In particular, we use the model to analyze whether market participants achieve to establish higher tax morale endogenously as a norm under increased tax transparency. Along our treatment variations, we make the following important observations.

First, avoiding taxes is the predominant choice of firms when they do not face the threat of being exposed. If consumers cannot distinguish between tax paying and tax avoiding firms, the individual firm’s monetary incentive to increase market shares and profits seems to outweigh the social incentive to utilize the benefit of the tax multiplier. As a result, we also observe the lowest total welfare in this scenario, indicating a socially undesirable outcome. Given that cost-benefit considerations of public good contributions are often less obvious in real life, firms’ incentives to avoid tax payments might even be higher when they do not face any potential downsides.

Second, making tax avoiding and tax paying firms identifiable in the market significantly improves tax morale. Interestingly, without additional information on the cost of tax avoidance, the effect seems to be mainly driven by firms’ anticipation of potential consumer sanctioning rather than actual changes in consumer behavior. This is also confirmed by the observation that firms show significantly higher tax morale from the very beginning, even before interacting with consumers on the market. Our

results thus indicate that reputational concerns do play a role for firms' tax decisions if they expect these decisions to be observable by the public. It is important to highlight that, in our experimental design, consumers can easily check whether a certain offer was made by a tax avoiding firm. One possible way to achieve this in real world consumption decisions would be the introduction of an official labelling system for corporate tax morale. This labelling system could be based on corporate tax returns, ensuring that no firm-specific confidential financial information – which is viewed as a problematic aspect of extensive country-by-country reporting (Cockfield and MacArthur, 2015, Devereux, 2011 and Evers et al., 2016) – other than the label itself would be publicly disclosed. One potential limitation of our study concerns the stylized modeling of the tax decision as a dichotomous choice. Of course, the complexity of a firm makes the question of how aggressively it applies tax planning strategies rather a continuum, which could be captured by, e.g., a traffic light labelling system.

Third, we find that once consumers also learn about the cost of tax avoidance, they do adjust their buying behavior. Specifically, we observe that consumers are more willing to pay price premia to tax paying firms when they are informed about the social and individual losses due to tax avoidance. This has an important implication for the current debate on how to counter aggressive tax planning. If policymakers aim to comprehensively internalize corporate tax morale in consumer goods markets, it is vital to inform them about the costs of tax avoidance, e.g., by publishing annual reports or including the corresponding losses in a labelling system as suggested above.

While we have studied how tax transparency can improve corporate tax morale in a stylized model, further research could refine the proposed labelling system with respect to real world applicability. For example, firms could be offered a broader spectrum of tax planning strategies which then would also be reflected in a more detailed labelling system. Moreover, the market environment in our experiment most closely resembles that of a price comparison website where displaying the firms' labels could be easily implemented. Further studies could explore the effect of increased tax transparency when consumers have to actively engage in acquiring the corresponding information. In any case, interventions targeting tax transparency seem promising, as they do not distort market efficiency: To the contrary, we find that social welfare increases with the degree of tax transparency in the market.

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## Appendix: Experimental instructions.

**Dear Participants,**

Welcome to the experiment.

Please read the experimental instructions carefully. All statements in the instructions are true. Your payment at the end of the experiment also depends on how well you have understood the instructions. If you have a question, please raise your hand. Your question will then be answered in private. The experiment and the data analysis are conducted anonymously.

From now on, please do not communicate with other participants and only use the devices provided by the experimenter. Please switch off all electronic devices.

Thank you very much for your attention and your participation in today's experiment.

## Introduction

There are two roles in this experiment: firms and consumers. In a common market, firms can offer a product, which consumers can buy. The experimental currency is called "Taler".

Each market consists of 4 firms and 4 consumers who can trade during 10 periods of 2 minutes each. Roles (firms and consumers) are assigned randomly at the beginning and remain unchanged throughout the experiment. You thus have the same role throughout the entire experiment and you are always interacting with the same firms and consumers.

In the following sections, you will learn more about the two roles.

### Firms

Firms can obtain the product from a central supplier. The price charged by the supplier is constant and the same for all firms. Firms are always free to decide at what price they wish to offer the product to the consumers. Offers always comprise of one unit of the product and each firm can only make one offer at a time.

For the duration of the experiment, firms receive the fixed labels "Firm 1", "Firm 2", "Firm 3" and "Firm 4". All market participants (firms and consumers) can observe which offer was made by which firm.

A sale is realized whenever a consumer accepts a firm's offer. In this case, the consumer pays the price demanded by the firm and receives one unit of the product in return. After paying a tax on the selling price, the firm also pays the central supplier. The remaining difference constitutes the firm's profit. Afterwards, the firm can make a new offer.

If a firm wants to change the price of an outstanding offer, they can cancel the existing offer and submit a new offer with the desired new price. Submitting and cancelling offers is free of charge.

*Final payout to firms:* At the end of each period, the firms' Taler profits are converted to Euro. Remaining outstanding offers are deleted free of charge. Additionally, all tax revenues of the state are evenly distributed to firms and consumers at the end of each period (see section "Taxes").

### **Consumers**

At the beginning of each period, consumers receive a fixed amount of Taler income that they can use to purchase the product. This income is the same for all consumers and remains constant during the experiment. Once a consumer has spent their income, they cannot purchase further units of the product in the corresponding period. Unused Taler income forfeits at the end of the period.

*Final payout to consumers:* At the end of each period, consumers receive a fixed Euro amount for each unit of the product they have purchased. Additionally, all tax revenues are evenly distributed to firms and consumers at the end of each period (see section "Taxes").

### **Taxes**

Firms have to pay 20% of the selling price as taxes. Taxes are paid to the state who, at the end of each period, distributes these revenues to all market participants as follows: All tax revenues are multiplied by a factor of 5 and then evenly distributed to all 8 market participants. These payments are credited to a separate account that will be converted to Euro and paid out at the end of the experiment.

Some firms have the possibility to avoid taxes. At the beginning of each period, these firms can decide whether or not to pay taxes in the current period. Firms who have the possibility to avoid taxes remain the same throughout the experiment.

[Treatment 1: The other market participants receive no information on which firms have decided to avoid taxes in the current period.]

[Treatment 2: All market participants can observe which firms have decided to avoid taxes in the current period.]

[Treatment 3: All market participants can observe which firms have decided to avoid taxes in the current period. Additionally, at the end of each period, every market participant receives detailed information on the losses due to tax avoidance for the state and for him/her individually.]

### **Your role: Consumer**

As a consumer, you can purchase the product from the firms in your market. Your market consists of 3 more consumers and 4 firms. At the beginning of each period, you receive 1,200 Taler as income on your account. Each time you accept a selling offer, you receive one unit of the product. At the same time, the corresponding price will be charged to your account and transferred to the selling firm.

### **Your payout**

Your Euro income depends on the number of purchases you make and the tax revenues of the state. You receive 20 Eurocents for each unit you have purchased. Tax revenues of the state are multiplied by 5 at the end of each period and then evenly distributed among all 8 market participants. The conversion rate of tax revenues from Taler to Eurocents is 10:1.

Unused Taler will forfeit at the end of each period. Taler that still remain in your account at the end of the period will neither be exchanged to Euro nor transferred to the next period.

*Your income from purchases:*

Income from purchases (in Eurocents) = number of purchased products × 20

*From the tax revenues of the state you receive:*

Income from taxes = (total tax revenues of the state × 5) : 8

*Your Euro income per period is hence given by:*

$$\text{Income (in Eurocents)} = \text{income from purchases} + \text{income from taxes} : 10$$

**Your total payout is the sum of your income in all periods. In addition, you receive a participation fee of 4 Euro.**

### **Information at the end of each period**

At the end of each period, you receive summary information about your purchases, the tax revenues of the state and your individual income from taxes.

[Treatment 3: Additionally, you receive detailed information on the losses due to tax avoidance for the state and for you individually.]



## Trading and summary screens

### Trading screen

The Trading screen interface includes the following components and callouts:

- Current period** (top left)
- Remaining time** (top right)
- Price chart of the current period** (left side)
- Overview of your wealth: Remaining Taler income and number of units you have already purchased in the current period.** (middle left)
- Previous prices in the current period** (top right panel)
- List of all outstanding offers, sorted by price. You can freely choose from all offers.** (bottom right panel)
- List of all firms who avoid taxes in the current period** (right side panel, with note: [This entire box is not displayed in Treatment 1.]

### Summary screen (at the end of each period)

The Summary screen interface includes the following components and callouts:

- Current period** (top left)
- Summary** (central panel):
  - Purchased products: Units
  - Tax revenues of the state: Taler
  - Your income from tax revenues: Taler
- Information about your income from purchases and from tax revenues of the state** (callout pointing to the Summary panel)
- Additional information on the losses due to tax avoidance for the state and for you individually** (callout pointing to the bottom text):
  - # In this period, products worth Taler have been purchased from tax avoiding firms.
  - # This caused a loss of Taler in tax revenues for the state after exclusion of the tax multiplier.
  - # On an individual level, you have lost Taler.
- [This information is displayed in Treatment 3 only.]** (note below the callout)
- Continue** button (bottom right)

### Your role: Firm

As a firm, you can resell the product from a central supplier to the consumers in your market. Your market consists of 3 more firms and 4 consumers. The purchase price of the product is 200 Taler for every firm and remains constant throughout the entire experiment. Each time a consumer accepts a selling offer from you, you are charged a 20% tax on the selling price. Then, 200 Taler are deducted for the central supplier. The remaining amount is your profit. A selling offer always comprises of unit of the product. You can only submit one offer at a time.

[All Treatments, Firm 1 and Firm 2: You do not have the possibility to avoid taxes.]

[All Treatments, Firm 3 and Firm 4: At the beginning of each period, you can decide whether you want to avoid taxes in the current period.]

### Your payout

Your Euro income depends on your profits and the tax revenues of the state. Tax revenues of the state are multiplied by 5 at the end of each period and then evenly distributed among all 8 market participants. The conversion rate of tax revenues from Taler to Eurocents is 10:1.

*Your Taler profit per unit sold is calculated as follows:*

[All Treatments, Firm 1 and Firm 2:

$$\text{Profit per unit} = \underbrace{\text{selling price} \times (1 - 0.2)}_{\text{sales revenue} - \text{tax}} - \underbrace{200}_{\text{purchase price}}$$

]

[All Treatments, Firm 3 and Firm 4:

$$\text{If you pay taxes: profit per unit} = \underbrace{\text{selling price} \times (1 - 0.2)}_{\text{sales revenue} - \text{tax}} - \underbrace{200}_{\text{purchase price}}$$

$$\text{If you avoid taxes: profit per unit} = \underbrace{\text{selling price}}_{\text{sales revenue}} - \underbrace{200}_{\text{purchase price}}$$

]

*From the tax revenues of the state you receive:*

$$\text{Income from taxes} = (\text{total tax revenues of the state} \times 5) : 8$$

*Your Euro income per period is hence given by:*

<b>Income (in Eurocents) = sum of profits : 10 + income from taxes : 10</b>
---

**Your total payout is the sum of your income in all periods. In addition, you receive a participation fee of 8 Euro.**

**Information at the end of each period**

At the end of each period, you receive summary information about your sales and your resulting profits, the tax revenues of the state and your individual income from taxes.

[Treatment 3: Additionally, you receive detailed information on the losses due to tax avoidance for the state and for you individually.]

## Trading and summary screens

### Trading screen

The trading screen interface includes the following components and callouts:

- Current period** and **Remaining time** indicators at the top.
- Price chart of the current period**: A chart showing price fluctuations.
- Sales summary**: A box showing the number of sales and profits in Taler for the current period.
- Profit calculator**: A box showing tax payment and profit based on a selected selling price.
- Previous prices**: A list of prices from the previous period.
- Wealth overview**: A box showing 'Units worth' and 'Profit (Taler)'.
- Offers**: A table with columns for 'Price' and 'Firm'.
- List of current tax avoiders**: A list of firms that avoid taxes.
- Offer submission**: A box with a 'Price' input field and a 'Submit offer' button.
- List of all firms who avoid taxes in the current period**: A callout pointing to the 'List of current tax avoiders' box, with a note: "[This entire box is not displayed in Treatment 1.]".
- List of all outstanding offers, sorted by price**: A callout pointing to the 'Offers' table, with a note: "Your offers are displayed in blue color. To cancel your offer, select the offer and click on 'Cancel'".
- Offer submission**: A callout pointing to the 'Submit offer' button, with a note: "Here, you can enter the selling price and confirm your offer by clicking on 'Submit offer'".

### Summary screen (at the end of each period)

The summary screen interface includes the following components and callouts:

- Current period** indicator at the top.
- Summary** section with a table:
 

Sold products	Units
Your profit	Taler
Tax revenues of the state	Taler
Your income from tax revenues	Taler
- Information on tax avoiding firms** section:
  - # In this period, products worth Taler have been purchased from tax avoiding firms.
  - # This caused a loss of Taler in tax revenues for the state after inclusion of the tax multiplier.
  - # On an individual level, you have lost Taler.
- Information about your income from sales profits and from tax revenues of the state**: A callout pointing to the 'Your profit' and 'Tax revenues of the state' rows in the summary table.
- Additional information on the losses due to tax avoidance for the state and for you individually**: A callout pointing to the 'Information on tax avoiding firms' section, with a note: "[This information is displayed in Treatment 3 only.]".
- Continue** button at the bottom right.

### Questionnaire

Please answer the questions below. When you have answered all the questions, please raise your hand.

How many firms (F) and how many consumers (C) participate in each market?	__ (F) __ (C)
What is the tax rate on the selling price for firms?	__%
What is the factor with which tax revenues are multiplied before they are redistributed?	__
Are the tax revenues evenly distributed to all market participants?	<input type="radio"/> Yes <input type="radio"/> No
Can all market participants observe which firms have decided to avoid taxes in the current period? [Correct answer depends on treatment.]	<input type="radio"/> Yes <input type="radio"/> No
Can consumers transfer unused Taler to the next period?	<input type="radio"/> Yes <input type="radio"/> No
What are the components of your Euro income? [Correct answer depends on participants' role.]	_____

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Michael Razen, Alexander Kupfer

Can increased tax transparency curb corporate tax avoidance?

**Abstract**

Tax avoidance among large multinational corporations has considerably increased in recent years, triggering an intense discussion about how to ensure tax justice. We propose a novel experimental design to incentive-compatibly model the firm-consumer relationship in a consumer goods market. This new paradigm allows us to analyze the effect of increased tax transparency on consumer and firm behavior in a dynamic framework. We find that absent the threat of being exposed as a tax avoiding firm, only 26 % of the firms decide to pay taxes. Once tax avoiding firms are identifiable in the market, this rate rises to 58 %. Providing market participants additionally with information about the social costs of tax avoidance increases the fraction of tax paying firms further to 74 %. We show that these improvements are the consequence of firms proactively adopting tax responsible behavior and, at the highest level of transparency, consumers showing a stronger proclivity to boycott tax avoiding firms, even if these firms offer cheaper prices. Our results confirm the effectiveness of increased transparency to curb corporate tax avoidance.

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