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Cautionary Tales:

Celebrities, the News Media, and Participation in Tax Amnesties

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Abstract

This study investigates whether press coverage on celebrities with tax issues affects the behavior of other tax payers. We compile an original data set for Germany, including regional information on the amount of tax payers using amnesty regulations to voluntarily disclose taxes they have evaded. The data set also includes counts of news reports published by 6 national and 54 local newspapers that address celebrity tax evaders who were publicly tried between January 2010 and June 2016. We find a strong correlation between the amount of self-denunciations and the news coverage. To identify the causal effect, we use exogenous variation in the reporting, resulting from disasters and terrorist attacks that coincide with the celebrity trials. Instrumental variable estimates suggest that an increase in news coverage by the amount of an average trial raises participation in the tax amnesty program by approximately 22.5%. This finding helps to better understand the effectiveness of tax amnesties, and it illustrates the economic implications of publicly trying famous personalities.

Keywords: news coverage; public trial; self-denunciation; tax evasion

JEL classification: D83; H26; K34; L82

1. Introduction

In March 2013, prosecutors and tax investigators searched the residence of Uli Hoeneß, the president of Germany's most famous soccer club Bayern Munich. Due to the risk of flight, he was immediately arrested, but was bailed out shortly afterwards. The public learned about the investigations a month later, but the extent of the crime remained concealed. When charges were brought against Hoeneß in July 2013, the prosecution accused him of tax evasion in the amount of 3.2 million euros. A public trial began on March 10, 2014. However, only four days later, when the verdict was announced, the full extent of evaded taxes – 28.5 million euros – became known. Hoeneß was sentenced to three and a half years of imprisonment, which he accepted without pursuing an appeal. The media covered the case, and especially the trial, due to several factors: his fame as a previous star player, the decades of influence as manager and president of Bayern Munich, and his polarizing character. At the same time, the authorities registered a strong increase in people participating in the tax amnesty program, which the media called the "Hoeneß effect."

Is it possible that media coverage of celebrity tax evaders affects the behavior of other tax payers? There are plausible reasons for such effects besides the anecdotal evidence from the Hoeneß case. Media coverage of celebrities with tax issues could be a carrier of information about tax regulations and related knowledge. While news outlets might provide such information without the involvement of celebrities, the dissemination likely is much more effective when famous athletes, politicians, or CEOs of large companies are the subject of the coverage (e.g., Garthwaite and Moore, 2013). Celebrities are often role models, who are closely monitored by the media. Due to the public interest, misbehavior or criminal activities usually lead to a large amount of news coverage. Such reports might contain information about what is legal and what not; which behaviors might be acceptable from an ethical point of view; what authorities' current auditing strategies are; and what kind of penalty convicts may receive. News coverage of celebrities is often characterized by personalization, emotion, and sometimes scandal, which makes background information with relevance to tax payers more salient. For instance, a celebrity being brought into court in handcuffs or pictures of a prison cell are powerful images that catch the attention of the public.

In this study, we cannot distinguish between these and other potential channels of media effects. However, we are able to test whether newspaper reports about celebrities with tax issues affect the behavior of other tax payers in a causal way. In particular, we consider the voluntary disclosure of

evaded taxes under tax amnesty regulations. We gather information from individual tax authorities about the amount of such self-denunciations in German federal states between January 2010 and June 2016. These figures are the basis of our main data set, which refers to 16 states and up to 26 quarters per state. In contrast to survey data, actually registered self-denunciations are an ideal measure in this context, because they are not vulnerable to non-response or untruthful answers.

To construct a measure of news coverage, we conduct keyword-based searches in full-text newspaper archives. Considering articles that contain the German word for tax evasion in their (sub)heading, we retrieve reports published by 6 national and 54 local newspapers. Text mining helps to ascertain that the search procedure yields meaningful results, in the sense that the extracted articles address topics such as investigation, prosecution, and sanctioning of tax evasion; the implementation and consequences of anti-tax evasion measures; negotiations with other countries and tax havens; or the macroeconomic damages of tax fraud. We weight quarterly state-specific counts of the articles by the regional circulation of the newspapers, and match the resulting values with the corresponding amount of self-denunciations.

In addition, we create a media-independent measure of the supply of news material. Using the existence of a Wikipedia entry as a criterion of prominence, we determine all cases in which famous personalities were publicly tried by a German court for tax evasion in the period of investigation. Wikipedia's page revision history allows us to verify that our list of personalities does not include any pure celebrity criminals; i.e., each personality achieved celebrity status prior to their tax problems, and due to some talent other than tax evasion. By considering only cases in which the trial was open to the public, we ascertain not to omit any news material. Based on these criteria, we register 32 trial openings and 33 closings, pertaining to 29 celebrities. The data indicate that the corresponding news coverage peaks at the time of the beginning and the end of the trial. When a public hearing starts, there is usually a surge of new details on the misbehavior of the defendant. Because a trial often closes with a verdict, there is also an increased likelihood of media coverage at that point.

Estimating the causal effect of press coverage about celebrity tax evaders is complicated by endogeneity issues. For instance, an exogenous increase in the amount of self-denunciations could cause the media to emphasize tax issues of famous personalities. In addition, third variables might affect the participation in the tax amnesty and the news coverage simultaneously, such as public

opinion or authorities' efforts to fight tax fraud. To identify the causal effect, we exploit exogenous variation in the amount of the press coverage, resulting from competing news events at the time of the beginning and end of the celebrity trials. Specifically, we use the number of fatalities due to disasters and terrorist attacks, because the occurrence of these events is usually not predictable. Data from Google search queries from the time prior to our period of investigation serve to weight the occurrence of the events by regional differences in reader demand for corresponding reports. In other words, we construct an instrumental variable (IV) that is the product of time-varying shocks to the national news agenda and cross-sectional variation in attention to these shocks.

The data indicate a strong correlation between the amount of self-denunciations and news coverage about celebrities with tax issues. Our estimates also suggest that disasters and terrorist attacks significantly reduce the amount of the news coverage if their occurrence coincides with the opening or closing of a celebrity trial. Placebo regressions show that there is no crowding out in case disasters and attacks do not coincide with the beginning and ending of the trials. Instrumenting with competing events, we estimate the causal effect of the news coverage by two-stage least squares (2SLS). According to our baseline specification, an increase in news coverage by the amount of an average trial raises the participation in the tax amnesty program by approximately 22.5%. This finding is robust to the inclusion of state, quarter, and year fixed effects; conditioning on the overall amount of tax investigations, major changes in tax regulations, bank data leaks, and tax CD purchases; different model specifications; excluding the extreme case of Uli Hoeneß; and using an alternative criterion of celebrity status.

Our findings contribute to studies that investigate the role of media for tax payers. Bo, Slemrod, and Thoresen (2015) show that the switch from the traditional to Internet-based public disclosure of tax filings in Norway caused people to report higher income levels. Using an experimental setting, Kasper, Kogler, and Kirchler (2015) find that newspaper reports on tax issues affect the intentions of participants to comply with the law. According to Battiston et al. (2016), the effect of tax audits on subsequent VAT payments is larger when the audit receives more attention from the media. In contrast to these studies, we investigate the role of news coverage about celebrities with tax issues. We find that this news coverage increases the likelihood that people voluntarily disclose taxes they invaded. Thus, tax authorities could have a special incentive to prosecute celebrity tax evaders. Therefore, an important normative implication of the findings is that regulations and

institutional mechanisms need to prevent authorities from making an example of celebrities, at least if a society pursues equality before the law.

In addition, we contribute to the literature specifically dealing with tax amnesty programs. This strand of research addresses the determinants of such programs (e.g., Le Borgne, 2006; Luitel and Tosun, 2014; Bayer, Oberhofer, and Winner, 2015; Bethmann and Kvasnicka, 2016), as well as the implications for tax evasion and revenues (e.g., Das-Gupta and Mookherjee, 1996; Luitel and Sobel, 2007; Langenmayr, 2015). Focusing on the influence of media, we expand this literature by providing evidence of what drives participation in tax amnesties. Finally, media coverage on celebrity tax evaders might not only spread case-specific facts, but also information about the social acceptability of certain behaviors. Therefore, our study relates to the debate on tax compliance due to intrinsic motivation as well (e.g., Kleven, 2014; Luttmer and Singhal, 2014; Dwenger et al., 2016).

The next section describes the institutional context. Afterwards, we provide details on the data and the identification strategy. We present and discuss the estimation results before concluding in the last section.

2. Institutional context

2.1 Tax amnesty regulations

According to German law, tax evasion is defined by the objective matter of tax reduction and the subjective matter of intent (i.e., knowledge and consent), whereby conditional intent (i.e., approving acceptance) is sufficient. Tax evasion, therefore, does not take place in the case of a missing sense of wrongdoing. Tax reduction occurs if taxes are not assessed at all, remain partially unassessed, or are not paid on time. Tax evasion is a criminal offense that is subject to compulsory prosecution. However, German amnesty regulations allow tax payers to rectify transgressions without being held criminally liable. The possibility of self-denunciation applies if incorrect statements are corrected, incomplete entries are complemented, or omitted information is provided. Although tax evasion is considered a completed crime, a legally successful self-denunciation results in mandatory exemption from criminal conviction, while the consequences according to the

tax laws remain in force. The incentives for self-denunciation derive from the avoidable punishment. An amount of evaded taxes exceeding 50,000 euros customarily leads to a suspended prison sentence. A monetary penalty is imposed above a threshold of 100,000 euros, and exceeding the one million mark results in at least two years of prison. In addition, another large incentive relates to the procedural consequences. Tax evaders can avoid being (publicly) tried if their self-denunciation is complete and valid.

In recent years, tax amnesty has been extensively discussed in the media and the trade press. Judges and numerous associations have been giving their opinions, and parliamentary statements have been released. In the course of the data leak of two Swiss banks at the beginning of 2010, public pressure increased and initiated changes in tax amnesty regulations. The first substantial adjustment occurred in April 2011. The Federal Court's decision to exclude the possibility to submit partial self-denunciations was legally consolidated, and a financial penalty for evaded taxes above 50,000 euros was introduced. The second major change of the law came into effect in January 2015, when the requirements for an effective self-denunciation became more difficult to meet: The statute of limitation was extended from five to at least ten years; the threshold for impunity was lowered from 50,000 to 25,000 euros of evaded taxes; and penalties as well as interest rates were raised substantially, requiring evaders to have sufficient liquid resources.

In addition to legal changes, tax payers had to face the erosion of the bank secret. For instance, there have been several leaks of large amounts of bank data (January 2011: Swiss Leaks I; May 2012: Luxembourg Leaks; May 2013: Offshore Leaks; February 2015: Swiss Leaks II). After the Federal Constitutional Court gave an official permission, German authorities also kept buying tax data CDs offered by whistleblowers, usually containing names and balances of German customers of foreign banks. Because tax amnesty is only granted when a self-denunciation is submitted before the crime has been detected, these events have been affecting the decision to voluntarily disclose tax evasion as well.

2.2 Public trials for tax evasion

Minor cases of tax evasion are handled without a trial to increase judicial efficiency. The court merely renders a decision based on the records. If the accused is found guilty, the judge issues a

penalty order. More severe cases are subject to a public or non-public court hearing. For a trial to be public, the amount of evaded taxes needs to exceed 1 million euros, which is when constant jurisdiction considers the interests of the general public to outweigh those of the individual.

Usually, it takes months or even years for a trial begin. When investigation authorities suspect tax fraud, they first need to collect sufficient evidence before handing over the case to the prosecution. The prosecutor evaluates the case while having to respect the defendant's rights, which often delays the process. When the prosecution decides to press charges, it again takes months until the trial takes place, because the court has to find an open slot in its schedule, while the defense exercises its right to take time to prepare its case. Some trials only take a couple of days, while others may last several months. A trial usually ends with a verdict, although sometimes the proceedings are discontinued or stopped. Verdicts can be appealed, in which case there might be further trials.

3. Data and identification

3.1 Self-denunciations

We obtain data on self-denunciations from the federal states' ministries of finance. In two cases, the numbers are publicly available on the official websites of the ministries (Hesse, North Rhine-Westphalia). For the remaining states, we directly contact the ministries to obtain the data. Most of the numbers are only available as of 2010, which is when our period of investigation begins. At the time of the collection of the data, the most recent figures covered the first two quarters of 2016.

Most states count the number of self-denunciations on a quarterly basis. Some data are available on a monthly basis, in which case we calculate the quarterly equivalent. The reason is the likely lag in the chain of events of celebrity news coverage, people's decision to disclose, and the actual receipt of the self-denunciation at the financial authority. When people decide to disclose their illegal behavior, it might take (the tax consultant) several weeks to prepare the documents necessary for the process to be effective. In addition, there are a few cases in which the ministries' period of counting does not exactly match a quarter. Here, we calculate quarterly figures by dividing the numbers proportionally. Some states only provide yearly or half-yearly data for parts of the period of investigation, especially for the earlier years. We exclude these low-frequency observations, because they do not provide information detailed enough to credibly estimate media effects. Based

on this restriction, our panel consists of 207 observations pertaining to 16 federal states, with up to 26 quarters per state. Unbalanced panel data may lead to biased estimates if the reasons for the missing observations correlate with the error term. The main explanation for differences in the availability of the data relates to the states' political intent and administrative barriers. Some states were willing and able to collect detailed data on self-denunciations early on (e.g., Berlin, Hesse, and North Rhine-Westphalia), whereas others started counting on a quarterly basis only at a later point (e.g., Bremen, Schleswig-Holstein, and Thuringia). That is, the missing observations are not random, but they can be accounted for by state fixed effects.

On average, German authorities registered 490.8 self-denunciations per quarter and state (cp. Table 1), which corresponds to 70.5 self-denunciations per 1,000,000 inhabitants.[1] Figure 1 shows the cross-sectional variation in this variable, according to which there is both a north-south and an east-west gap, caused by differences in capital income and the proximity of the federal states in the southwest to Luxembourg, Switzerland, and Liechtenstein.

There are also substantial differences over time, as shown in Figure 2. The largest share of self-denunciations was registered in the first quarter of 2010, coinciding both with the first federal state buying a tax CD (North Rhine-Westphalia) and the first leaking of bank data to the Federal Central Tax Office (Swiss Leaks I). We observe the second largest share in the first quarter of 2014, which is when the trial against Uli Hoeneß took place.

3.2 Celebrity tax evasion trials

We use public trials for tax evasion committed by celebrities to obtain a basis of similar cases of supply of news material. The goal is to create a list of cases that are comparable in terms of the severity of the offense and the level of the celebrities' fame.

Comparability of the severity of the offense can be achieved by focusing on trials that are public. In the context of tax evasion, a public trial takes place if the amount of evaded taxes exceeds 1

[1] In the regressions, state fixed effects capture differences due to varying population numbers, so that we can use the absolute amount of self-denunciations as the dependent variable. However, when describing the variable graphically, we show the share of self-denunciations per 1,000,000 inhabitants, based on population data from the Federal Statistical Office.

million euros. This threshold has the additional advantage that it is not difficult to identify the relevant cases. It is reasonable to assume that cases, in which a celebrity commits a crime of such severity, will not remain unnoticed. Since we do not consider penalty orders – which might actually remain unnoticed – but non-secret trials, it is guaranteed that the public learns about the cases.[2] To identify the trials, we first conduct a comprehensive search in Google, Nexis, and Genios, using combinations of German keywords – including synonyms and truncations – for the terms tax evasion, trial, and verdict. Based on this search, we create a list of potential celebrities, for which we can verify that they were brought to public trial in Germany at least once in our period of investigation.

It is also necessary to apply some criterion of fame, in order to avoid discretionary decisions about which individuals on our list of potential celebrities should be considered actual celebrities. For that purpose, we use a definition of celebrity status that is independent of tax issues: the existence of an individual entry in the German edition of Wikipedia. The free encyclopedia makes new entries pass a relevance check of the topic, based on lists of context-related indicators. When the relevance of a personality is ambiguous, the decision about whether or not the celebrity deserves her own Wikipedia page is made by the community. Thus, we consider the Wikipedia consensus as kind of a crowd-sourced evaluation of celebrity status. From our pool of potential celebrities, 29 persons have a German Wikipedia page, for which we observe 32 trial openings and 33 trial closings. These numbers translate slightly disproportionately into an average of 1.50 openings and 1.37 closings per quarter, due to the unbalanced design of the panel data. In the robustness section, we verify that the estimates do not substantially change when using an alternative definition of celebrity status (i.e., an entry in Munzinger's biographical archive).

Table A1 in the Appendix lists all personalities standing public trial and meeting the Wikipedia celebrity criterion. The list includes model Nadja Auermann, former national soccer goalkeeper Oliver Kahn, former Volkswagen chairman Bernd Pischetsrieder, and Bayern Munich protagonist

[2] There are many cases in which trials that are not public, legally speaking, become public because of media reports. However, we do not include these cases because the probability that they are made public could be affected by the occurrence of competing news events, which would compromise our identification strategy.

Uli Hoeneß. Using Wikipedia's page revision history allows us to rule out that any of these celebrities obtained their Wikipedia entry because of tax issues. Each personality achieved celebrity status due some other talent or position and prior to their tax problems.

3.3 News coverage

We use newspaper stories on tax evasion by celebrities to evaluate the effects on self-denunciations. The focus is on newspapers for several reasons. First, this type of media allows to consistently determine the amount of relevant news over time. With online news outlets, for example, it would not be possible to achieve this kind of consistency, as new media continues to develop. This development implies a general variation in news amounts associated with the increasing popularity of online media, making comparisons over time difficult. Second, digital full-text archives allow for an analysis of newspaper content, including keyword-based searches. This kind of data is not available for online news, newscasts, and radio news in Germany. Third, in contrast to most online news outlets and television channels, Germany's newspaper landscape consists of a variety of local outlets, which allows us to exploit spatial variation in the news coverage. We assume that neglecting newscasts, radio news, and online outlets does not pose a severe problem, due to the continuing agenda-setting role of the press. While many other media barely produce content themselves, most newspapers rely on editorial and journalistic input.

Our major source to extract the reports is Genios, a German provider of business information, market data, and press archives. In the period under consideration, the company's newspaper archive offers consistent full-text access to 54 local and the three national daily outlets Handelsblatt, Die Tageszeitung, and Die Welt. We complement the sample with the national daily newspapers Frankfurter Allgemeine Zeitung (publisher's archive), Frankfurter Rundschau (Nexis database), and Süddeutsche Zeitung (publisher's archive). The sample then includes all German national dailies, except for the tabloid Bild, since data are unavailable here. The sample also comprises most of the largest local newspapers; it contains outlets from 8 out of the 10 largest (local) publishing companies; and the combined circulation of the local newspapers accounts for about 40% of the market (according to the second quarter of 2014; KEK, 2015). Table A2 in provides a list of the newspapers in the sample and their area of circulation.

We extract all articles that contain the word "Steuerhinterziehung" (tax evasion) in their heading or subheading. In the period under consideration, the search retrieves 2,112 articles, of which 338 contain the last name of a person from our list of Wikipedia celebrities in the sub(heading). We also check related search terms, such as "Steuervermeidung" (tax engineering) and "Steuerbetrug" (tax fraud); however, these and other terms do not yield additional hits. To simplify matters for readers, the press almost always uses "Steuerhinterziehung" as a catch-all term, even if it does not describe the issue at hand in the legally most precise way. Applying the principle of the "inverted pyramid" when structuring their articles, journalists include "Steuerhinterziehung" as a buzz word in the (sub)heading, so that readers can quickly recognize the topic of the report. Restricting our search query to the (sub)heading thus reduces the number of false positives; i.e., reports mainly addressing a topic other than tax evasion. A prominent example of such false positives are soccer-related articles, which cite Uli Hoeneß' comments on the last game, while briefly mentioning his legal problems due to tax evasion.

Inspecting the retrieved articles indicates that most of the news coverage deals with the following: events associated with individual tax crime, such as investigations, prosecution, or court rulings; discussions, implementations, and consequences of reforms aiming to fight tax evasion; data leaks that might expose tax defrauders; authorities buying or being offered tax CDs; other countries' behavior if it has implications for tax evasion in Germany; and economic damages of tax fraud.

We conduct simple text mining to further show that searching for the keyword "Steuerhinterziehung" in the (sub)heading produces meaningful results. Table A3 in the Appendix lists the 100 most frequently used terms in the extracted articles. Not surprisingly, the German word for tax evasion appears in the first rank, as well as word deviations (Steuersünder, Steuerhinterzieher) in following positions. In addition, the ranking includes the countries Schweiz (Switzerland) and Luxemburg (Luxembourg), two of the most common destinations for Germans to hide money. Terms that immediately relate to the context, such as Bank (bank), Selbstanzeige (self-denunciation), Finanzamt (tax authority), and Steuerfahnder (tax investigator), also suggest that the search procedure yields meaningful results. Finally, there is a large amount of words illustrating public efforts of fighting tax evasion, including Staatsanwaltschaft (prosecution), Gericht (court), Ermittlungen (investigations), Prozess (trial), Urteil (verdict), Anklage (indictment), Richter (judge), Strafe (sentence), Gefängnis (prison), Anwalt (lawyer), Bewährung (probation), and Razzia (raid).

We match the amount of news coverage and the amount of self-denunciations by state s and quarter q.[3] Because the six national newspapers can be read everywhere in Germany, we assume that their coverage might affect self-denunciations in all states, but depending on the outlets' regional circulation. In addition, we assume that the potential effects of reports of the local newspapers are largest in those regions in which the outlets circulate. Thus, we measure the amount of news coverage a^* as the sum of articles in national newspapers $a_{n,q}$ and relevant local outlets $a_{l_s,q}$:

$$a^*_{s,q} = \sum_{n_s=1}^{N_s} a_{n,q} c_{n_s,q} + \sum_{l_s=1}^{L_s} a_{l_s,q} c_{l_s,q} \quad (1)$$

To account for the varying importance of the newspapers in the sample, the national and local news amounts are weighted by the outlets' within-sample, state-specific circulation shares $c_{n_s,q}$ and $c_{l_s q}$. These shares are calculated based on data from the German audit bureau of circulation (Informationsgesellschaft zur Feststellung der Verbreitung von Werbeträgern, IVW). Although the circulation data are provided on a quarterly basis, we only use the numbers of each year's first quarter; doing so prevents the news variable from being affected by the seasonal patterns that usually characterize newspaper circulation. Data on the regional circulation of the national newspapers come from the Allensbach Media Market Analysis (Allensbacher Markt- und Werbeträgeranalyse, AWA) and directly from the publisher, in the case of Die Tageszeitung.

To ease the interpretation of the results, the weighted news amount is normalized to have the same sample mean as the unweighted counterpart ($\bar{a}$):

$$a^{norm}_{s,q} = \frac{a^*_{s,q} \bar{a}}{\bar{a}^*} \quad (2)$$

[3] It could be argued that the relative amount of news coverage (i.e., the share of relevant reports per newspaper issue) might be more appropriate to construct the news measure than absolute numbers. Unfortunately, our data do not include information on the volume of individual newspaper issues. We do not believe that this is a problem though, because there is only little variation in the volume of Germany newspapers over time (Garz and Sörensen, 2017), and variation across newspapers can be captured by state fixed effects.

Figures 3 and 4 show the regional and time-wise distribution of the resulting variable. The differences across states already hint towards a positive correlation between the amount of reports and the amount of self-denunciations. There is also substantial variation over time. The two largest peaks, in the second quarter of 2013 and the first quarter of 2014, coincide with the investigations against Uli Hoeneß becoming public knowledge and his trial, respectively. In the last quarter of 2011, which denotes the third-largest peak of the news coverage, verdicts were announced against model Nadja Auermann and former Volkswagen chair Bernd Pischetsrieder.

Figure 5 shows the daily distribution of the celebrity coverage in relation to the trial openings and closings. The graph indicates that more than a fifth of the articles in the 30 days around the date of the opening or closing are published on that date, and more than half of the reports are published the day after. Both days account for 72.2% of the articles. The concentration of reports in this two-day window is crucial for the identification strategy of this study, because it allows to exploit variation in the amount of the reporting due to a crowding out by news about coinciding disasters and terrorist attacks.

3.4 Control variables

The panel data allow the empirical models to include quarter, year, and state fixed effects. Quarter fixed effects control for seasonal differences in the amount of self-denunciations and news coverage, whereas the year dummies capture unobserved, long-term variation. The state fixed effects account for time-invariant differences across the federal states. A state-specific, linear time trend captures further unobserved developments.

The reporting about celebrity tax evaders depends on the amount of celebrity trials. This amount also affects the quarterly number of opportunities when disasters and terrorist attacks could crowd out celebrity news. Therefore, we control for the number of trial openings, trial closings, and ongoing trials in each quarter. These three variables only vary over time (i.e., for a given quarter their value is equal across the states) because of the national significance of celebrity trials.

In addition, we construct variables that capture major changes and events affecting the risks and benefits of tax evasion from the tax defrauders' perspective (the "tax evasion environment", see

also Table A4). First, we contact the states' prosecution departments ("Landesstaatsanwaltschaften") to obtain data on criminal investigations for tax evasion. The quarterly state-specific amount of completed investigations serves as a proxy for the efforts of the authorities to fight tax evasion.[4] Next, we construct a dummy variable to account for the effects of tax authorities buying illegally obtained data that help to convict tax evaders. Due to their controversial nature, these tax CDs have been heavily discussed in the public, which makes it easy to identify the relevant purchases. We add two cases in which the authorities publicly considered buying a CD, because this might also affect the amount of self-denunciations and tax evasion news coverage. The dummy identifies the states and quarters in which the CDs were bought or considered to be bought. In addition, we control for two major changes in the legal environment resulting from landmark court decisions: (1) the May 2010 resolution of the Federal Court to abolish the possibility of partial self-denunciations and (2) the November 2010 ruling of the Federal Constitutional Court, allowing the usage of illegally obtained tax data for criminal prosecution. Both variables only vary over time. They take the value 1 in the quarter of the ruling and afterwards. Finally, we use a binary variable to capture the four tax data leaks in the period under consideration (Swiss Leaks I and II, Luxembourg Leaks, Offshore Leaks). This dummy also varies only over time, taking the value 1 in the quarters the leaks occurred.

We also tested dummy variables to capture effects associated with two major changes of the national law. The first change limited the effectiveness of self-denunciations as of April 2011, and the second one restricted the scope of self-denunciations after 2014. However, we decided to not include these dummies, because they lead to severe problems with multicollinearity. For the same reason, we refrain from using explicit controls for the developments associated with the Common Reporting Standard (a multilateral agreement on the exchange of data) and the Swiss-German treaty on the taxation of capital gains (which Germany failed to ratify). There are multiple events related to these agreements for which dummy variables could be constructed, such as the balloting, signing, taking effect, or rejection. However, these events often coincide with the timing of other changes already controlled for or that are absorbed by the time fixed effects.

[4] In four cases, we have to interpolate parts of the data to obtain quarterly values, because the authorities only have annual records (Bremen, Hamburg, Hesse, and Saxony Anhalt).

3.5 Competing news events

3.5.1 Sources and measurement

The main idea when constructing the instruments is to use variation over time caused by the occurrence of terrorist attacks and disasters in combination with cross-sectional differences in readers' interest in news coverage about these events. We focus on disasters and terrorist attacks because these events usually cannot be predicted, which makes it very unlikely that our identification strategy is compromised by efforts of the authorities to manipulate the timing of public trials in the interest of public attention.

Information on competing news events are obtained from the EM-DAT International Disaster Database[5] and the Global Terrorism Database of the National Consortium for the Study of Terrorism and Responses to Terrorism (START) at the University of Maryland. The former database includes all natural and man-made disasters worldwide, if at least ten people were reported to be killed, at least 100 people reported to be affected, a state of emergency declared, or international assistance requested. The latter database includes all terrorist attacks worldwide that were intentional, entailed violence or the immediate threat of violence, and were committed by non-state actors. It is plausible to assume that a disaster or attack is more likely to be covered when the number of fatalities are higher. Other news factors, such as the location of the event and the surprise factor, might be important as well but the number of deaths arguably is the most prominent proxy for the news pressure caused by a disaster or attack. For that reason, the first component to construct our instruments is the number of fatalities of those disasters and attacks that coincide with the celebrity trials. Considering the publication pattern shown in Figure 5, we use the sum of fatalities on the day and the day after the trial opening or closing. If a disaster lasted longer than one day, which often happens in the case of floods or cold waves, we divide the amount of fatalities by the number of days the disaster is recorded. Based on this procedure, we construct a variable that counts the quarterly number of fatalities of coinciding disasters and terrorist attacks.[6] This measure only varies over time because the competing events are shocks to the national news agenda. Due to their

[5] EM-DAT: The Emergency Events Database – Université catholique de Louvain (UCL) – CRED, D. Guha-Sapir – www.emdat.be, Brussels, Belgium.

[6] We do not use the actual amount of reports about competing events, because this number might be affected by reporting about celebrity trials. That is, a large number of articles about celebrities could reduce the coverage of disasters and terrorist attacks, which would be a violation of the exclusion restriction. There is no risk of violation when counting the number of fatalities of competing disasters and attacks.

large newsworthiness, the events are usually covered all over Germany, even the ones that take place in individual German states. For instance, the crowd disaster at the 2010 Love Parade festival, which caused the death of 19 people, occurred in Duisburg. However, the accident was not only covered by the press in North Rhine-Westphalia, but by newspapers all over Germany. The same applies to the celebrity trials, which is why the place of the court hearing cannot be used to create regional variation in the instrument either.

Therefore, we weight the number of fatalities by regional variation in the general attention to terrorist attacks and different types of disasters. The idea is that the salience of current news events varies across federal states. For instance, because of different historical experiences: People in Baden-Wuerttemberg and Saarland are more receptive to news about earthquakes, as these people live in the German earthquake area; readers from the south of Germany likely pay more attention to reports about flood disasters, due to their experience with high water; and news about landslides is more salient in Saxony-Anhalt, after several people died when a strip mine caused parts of the village of Nachterstedt to be buried after a slump in 2009. News media are known to cater to the interests of their audiences (e.g., Mullainathan and Shleifer, 2005; Gentzkow and Shapiro, 2006, 2010; Chan and Suen, 2008), which leads to cross-sectional variation in the amount of coverage about terrorist attacks and disasters.

We use data on Google searches from 2005 to 2009 to quantify state-specific differences in attention to the events. Focusing on the time before our period of investigation ensures that these interests are not affected by current disasters and attacks. Using Google Trends, we obtain the amount of search queries on German keywords that correspond to the classification of disasters used in EM-DAT – earthquakes, epidemics, extreme temperature, floods, landslides, storms, technological disasters, wildfires – as well as the keyword "terrorism". For each keyword, Google provides the normalized, relative search volume. The federal state with the largest search volume receives a value of 100%, which is then compared to the search volume of another state (e.g., 70%). These percentages, in turn, are based on the absolute number of keyword searches relative to a state's overall amount of search queries. See Figure A1 in the Appendix for details.

By weighting the time-varying news shocks resulting from disasters and terrorist attacks by the Google search data, we assume that the crowding out of reports on celebrity tax evaders is largest

in those states where the readers have the greatest interest in the different competing events. Formally, for each state s and quarter q, the instrument is defined as:

$$fatalities^{*}_{s,q} = \sum_{j=1}^{J} fatalities_{q,j}\bar{g}_{s,j} \tag{3}$$

where $\bar{g}$ is the 2005 to 2009 state-specific average of the relative Google search volume pertaining to event type j, and $fatalities$ counts the quarterly number of deaths due to those disasters and attacks that take place on the day or the day after a trial opening or closing. Thus $fatalities^{*}$ is the product of the cross-sectional interest in different types of competing events and the time-varying occurrence of disasters and attacks. Instruments referring to the congestion of the news agenda have been widely applied before; for example, in the context of disaster news (Eisensee and Strömberg, 2007), scandal coverage (Nyhan, 2014), campaign coverage (Garcia-Jimeno and Yildirim, 2017), reports about unemployment (Garz, 2017), news about criminal politicians (Garz and Sörensen, 2017), and coverage of terrorist attacks (Jetter, 2017). Weighting national news shocks by predetermined, regional variation in the demand for different kinds of news is similar to instruments that combine time-varying trends and initial, cross-sectional differences. For instance, such instruments have been used to predict labor demand (Bartik, 1991), effects of schooling (Duflo, 2001), or news coverage on climate change (Beattie, 2017). In most regressions, we split the weighted number of $fatalities^{*}$ into two instruments, one pertaining to disasters and the other one relating to terrorist attacks. Using two instruments has the advantage of being able to test for overidentifying restrictions.

3.5.2 Instrument validity

For an instrument to be valid, it needs to be a strong predictor of the endogenous regressor, and it must not violate the exclusion restriction. The first criterion, the relevance of the instrument, can be tested empirically. We present corresponding test statistics in the next section, when discussing the results of the 2SLS estimates. The exclusion restriction cannot be tested, but we discuss the

conditions that need to be fulfilled for the restriction to hold. To begin with, there must be no reverse causality. Meeting this condition is unproblematic here because neither the amount of self-denunciations nor the volume of the reporting could possibly affect the occurrence of the competing events, especially that of natural disasters. Even in the case of technological disasters and terrorist attacks, such effects are extremely implausible. The same applies to cross-sectional differences in the demand for news about these events, since we use past values here. In addition, the occurrence of disasters and attacks must not correlate with any unobserved variable that could also affect the amount of self-denunciations or the volume of the news coverage. After controlling for state and time fixed effects, there is no reason why the instrument should not meet this condition.

Finally, disasters or attacks must not have a direct effect on the amount of self-denunciations. For instance, it could be argued that tax evaders want to redeem themselves when terrible events take place, since they feel sorry for the victims. Such a mechanism seems far-fetched, though; it is much more likely that people donate rather than risking incriminating themselves by voluntarily disclosing their tax evasion. Table 2 presents placebo regressions in support of this argument. It shows regressions of the quarterly amount of self-denunciations and celebrity news coverage, respectively, on the weighted number of fatalities of *competing* and *non-competing* news events. Here, non-competing events are those disasters and terrorist attacks that do not coincide with the dates of the beginnings and endings of the celebrity trials, including five days before and after these dates. The estimates suggest that the non-competing events neither have a significant effect on self-denunciations nor celebrity news coverage. In contrast, those disasters and terrorist attacks that coincide with trial openings and closings have a highly significant impact. Thus, it is plausible to assume that disasters and attacks do not affect self-denunciations other than through the crowding out of tax evasion news. Note that the results in Column (2) support the relevance of the instruments, whereas Column (1) indicates the existence of a strong reduced-form relationship between self-denunciations and competing news events.

Another concern could be that the competing events are not perfectly unpredictable; for instance, in the case of severe weather conditions or health epidemics. According to previous research, decision makers might want to manipulate the timing of their actions to exploit the public distraction that comes with large news events (e.g., deHaan, Shevlin, and Thornock, 2015; Durante and Zhuravskaya, 2016; Garz and Maass, 2017). We do not expect that this kind of manipulation is

feasible in the context of public trials for tax evasion by celebrities, because of procedural regulations, administrative hurdles, and the influence of many actors with different interests. Table A5 in the Appendix confirms this expectation. Using daily observations between January 2010 and June 2016, we regress the number of trial openings and closings on the amount of disaster and terror fatalities. However, the estimates suggest that the occurrence of the trials is not influenced by the number of fatalities on that day, or the number of fatalities on the surrounding days.

4. Results

The main variable pairs in question exhibit the expected bivariate relationships. As Figure A2 illustrates, the amount of self-denunciations and reports about celebrity tax evaders correlate positively. The relationship between the news coverage and the weighted sum of fatalities is negative (Figure A3), as is the one between self-denunciations and fatalities (Figure A4).

4.1 Baseline specification

Formally, we estimate the causal effect of the news coverage a^{norm} on the amount of self-denunciations d in state s and quarter q using 2SLS:

$$a_{s,q}^{norm} = \beta_1 + \beta_2 fatalities_{s,q}^{*,disaster} + \beta_3 fatalities_{s,q}^{*,terror} + \beta_4 X_{s,q} + \varepsilon_{s,q} \quad (4)$$

$$d_{s,q} = \gamma_1 + \gamma_2 \hat{a}_{s,q}^{norm} + \gamma_3 X_{s,q} + \epsilon_{s,q} \quad (5)$$

Equation (4) denotes the first stage. It is used to estimate the impact of the weighted number of $fatalities^*$ on the news coverage. Equation (5), from which the instruments are excluded, contains the predicted values $\hat{a}^{norm}$ of the news coverage, so that γ_2 captures the causal effect on the amount of self-denunciations. The variable vector X includes controls for tax CD purchases, major court rulings, tax data leaks, the overall amount of tax investigations, the number of openings and closings of celebrity trials, the number of ongoing celebrity trials, a state-specific linear time trend, as well as state, quarter, and year fixed effects. We do not include any lags or leads of the variables because tax payers, authorities, and especially the media often anticipate developments, which

causes the time series to be "contaminated" with expectations and forward-looking behavior. That is, in contrast to the instruments, lagged values fail to address simultaneity issues here because they are not even sequentially exogenous (e.g., Reed, 2015; Bellamare, Masaki, and Pepinsky, 2017). As a consequence, estimators for dynamic panel data (e.g., Arellano-Bond) would not be consistent. However, we compute standard errors that are robust to arbitrary heteroscedasticity and autocorrelation. We refrain from clustering the standard errors by federal states, as the small number of clusters might result in biased, overly narrow confidence intervals.

Table 3 summarizes the estimation results. Column (1) indicates that the correlation between self-denunciations and the news coverage remains highly significant after conditioning on the control variables. Column (2) shows the first-stage estimates, which confirm that there is a crowding out of celebrity news by competing events. A one standard deviation increase in disaster fatalities (= 208.18) leads to a decrease in coverage by 2.71 reports or 66.9%. The magnitude of the effect of terrorist attacks is similar. Here, a one standard deviation increase in fatalities (= 261.94) reduces the coverage by 55.6%. The F-statistic on the exclusion of the instruments is well above the often-used reference value of 10, which supports the relevance of the competing events in providing exogenous variation. According to Hansen's test on overidentifying restrictions, the joint null hypothesis that the instruments are valid cannot be rejected. The causal effect of the news coverage on the amount of self-denunciations is shown in Column (3). The IV coefficient is about three times as large as its OLS counterpart, which is a common finding when using this kind of instrument (e.g., Eisensee and Strömberg, 2007; Garz and Sörensen, 2017). While the OLS coefficient relates to the average effect across all cases, the IV estimate refers to trials that are marginally newsworthy. The larger IV coefficient thus implies that the impact of the news coverage is stronger for trials when the decision to report is sensitive to the occurrence and severity of competing news events. The value of 39.09 of this coefficient implies that a one standard deviation increase in news coverage (= 7.54 articles) raises the amount of self-denunciations by 294.74, which equals 60.1% of the mean and 44.5% of the standard deviation of self-denunciations. However, due to the large variation in news coverage and self-denunciations, it might be more informative to interpret the magnitude of the effect in terms of the underlying trials. On average, a trial opening and closing jointly receive 2.82 articles; an increase in news coverage by the amount of an average

trial thus raises the participation in the tax amnesty program in a given quarter by 22.5%.

4.2 Robustness

First, we evaluate the robustness of the findings by modifying the construction of the instruments. In the baseline specification, we assume that the crowding out of celebrity news coverage takes place on the day and the day after the trial opening or closing. Figure 5 shows that most reports on the trials come out on these two days, but some articles are also published on the two days before the date of the opening or closing, as well as on the second day after that date. Thus, it is worth evaluating if the results hold when using the weighted sum of fatalities in the five-day window around the beginning and ending of the trial (i.e., two days before, day zero, and two days after). Columns (1) and (2) in Table A6 in the Appendix show the resulting estimates when using these alternative instruments: Competing disasters do not affect the news coverage anymore, whereas the crowding out due to competing terrorist attacks is still highly significant. As consequence, the size of the effect of the news coverage on self-denunciations slightly decreases but remains highly significant. Another modification of the instruments refers to the location at which the disasters and attacks occur. The baseline instruments relate to events worldwide, but the German press likely emphasizes disasters and attacks taking place in Germany. For this reason, we only use fatalities in Germany to create the instrument. This approach reduces the number of coinciding events substantially, to the point that there are no competing terrorist attacks. Using the weighted sum of disaster fatalities as a single instrument confirms the findings, as Columns (3) and (4) in Table A6 show. However, the size of the effect of the news coverage decreases, as does the precision of the estimate.

Second, it is useful to include the two instruments individually in order to rule out that the effects are exclusively driven either by disasters or attacks. Table A7 shows the resulting estimates. The first-stage coefficients are very similar to those of the baseline model. However, the size of the effect on self-denunciations slightly decreases when only using the sum of disaster fatalities as an instrument, whereas the effect is a bit larger in the case of terrorist attacks (see Columns 2 and 4).

Third, we change the selection of celebrities used for the analysis. Table A8, Columns (1) and (2),

present estimates when excluding the case of Uli Hoeneß. The press coverage on this case accounts for more than half of the articles in the sample. However, as the estimates indicate, the findings are not exclusively driven by Uli Hoeneß; the coefficients of interest remain highly significant and qualitatively unchanged. In Columns (3) and (4), we use a different definition of celebrity status. Specifically, we consider the existence of an entry in Munzinger's biographical archive. Munzinger's decision to set up an entry is based on objective criteria and some level of discretion by the editors; see www.munzinger.de for details. Using the Munzinger instead of the Wikipedia criterion decreases the number of celebrities to 15 (all of whom also have a Wikipedia entry). The resulting estimates are very similar to the baseline specification, though.

Another robustness check addresses the lag between tax payers' decision to come clean and the submission of the self-denunciation. As mentioned in Section 3.1, it might take the tax consultant several weeks to complete the necessary paperwork. We are unaware of any statistics about the length of this process. However, from talking to experienced tax consultants it can be assumed that it could take three weeks, on average, to submit the self-denunciation. To verify whether this lag has any effects on our findings, we shift all articles published in the last three weeks of a quarter to the next quarter. Table A9 summarizes the results of this exercise, according to which the estimates do not change in a substantial way.

Next, it could be argued that our models do not account for the temporal dynamics of the panel data. We believe that the inclusion of lagged variables does not tackle endogeneity issues when time series are contaminated with anticipatory behavior, or that the absence of lagged values leads to omitted variable bias. However, it is useful to show that the findings do not substantially change when including lagged values of the outcome. Table A10 shows the resulting estimates. The coefficients have to be interpreted with care, since estimates of fixed effects models with lagged dependent variables could be biased, especially when the time dimension of the panel is small. The amount of self-denunciations in the previous quarter is a strong predictor of current self-denunciations, even though the corresponding coefficients are likely biased downwards (Nickell, 1981). Although the remaining coefficients might be biased upwards, there is still convincing evidence of a causal effect on the participation in the tax amnesty program.

Finally, we check if the coefficients of interest remain statistically significant when using alternative approaches to calculate the confidence intervals. In our baseline models, we compute standard

errors to be robust to autocorrelation and heteroscedasticity. Columns (1) and (2) in Table A11 instead show estimates with standard errors that are only robust to heteroscedasticity, whereas we cluster the standard errors by state in Columns (3) and (4). In both cases, the confidence intervals slightly increase, but the coefficients of interest remain significant at the 1% level.

5. Conclusion

This study investigates whether news coverage about celebrities with tax problems affects the likelihood that people voluntarily disclose taxes they evaded. Using the existence of an individual Wikipedia entry as a criterion for prominence, we compile a list of celebrities who were publicly tried in Germany for tax evasion between January 2010 and June 2016. We search 6 national and 54 regional newspapers for related coverage and find that the volume of this coverage correlates strongly with the amount of self-denunciations in the federal states. The data also show that the reporting peaks at the beginning and ending of the celebrity trials, and that there is a crowding out of the news coverage if the trial opening or closing coincides with severe disasters or terrorist attacks. This phenomenon can be exploited to identify the causal effect of celebrity news coverage. We use data on Google search queries – from the time prior to our period of investigation – to weight the competing events by regional differences in the attention to attacks and different types of disasters. In other words, we construct an instrument that is the product of time-varying shocks to the national news agenda and cross-sectional differences in the demand for news coverage about different events. IV estimates indicate that an increase in news coverage by the extent of an average trial raises the quarterly amount of self-denunciations by approximately 22.5%. Thus, celebrity trials can be cautionary tales for many unlawful tax payers. The magnitude of the effect is large, but the usual disclaimer about local average treatment effects applies. In addition, it remains open whether the effect would be similar in other countries and at different times, since it refers to a period in Germany in which the risks and benefits of tax evasion changed substantially. It is worth mentioning that the effect has at least medium-term implications because the chances of relapse are particularly small. At the moment of the self-denunciation, the tax authorities not only collect the missing fees – including interest and penalties – but also assess future taxes.

The research design of this study is not without limitations. The data we obtained from the ministries of finance refer to self-denunciations related to foreign capital accounts, often located in

Switzerland or Liechtenstein. Thus, our findings only apply to the evasion of capital gains tax, a tax category that merely represents a fraction of overall revenues. In addition, the data cannot reveal any insights into the potential heterogeneity of the media effects. If there was information on the demographics of individuals voluntarily disclosing tax evasion, it would be possible to investigate whether some people are more receptive to news coverage than others. Also, the data do not contain information that would allow to address the role of tax consultants in this context. For example, it would be interesting to evaluate whether these advisers act as additional intermediaries; i.e., if self-denunciations are often based on recommendations of consultants, compared to cases of clients approaching their advisers first.

Despite these limitations, the findings of this study have important implications. The results show that participation in tax amnesties is strongly affected by the media. Policy makers who are interested in maximizing revenues from tax amnesty programs not only need to pay attention to tax havens, data leaks, or court decisions, but may also want to account for news coverage on these issues. Specifically, the findings indicate that the way authorities, courts, and the press deal with prominent tax evaders can be crucial for the behavior of other tax payers. Because celebrity trials have a signaling effect, it is important that famous personalities are not granted a bonus when they are tried; otherwise, tax evasion might be encouraged. However, prosecutors and judges also have to resist the temptation of making an example of celebrities because democratic societies are built on the equal treatment of their members, independent of fame. This argument applies to the media as well. It would be desirable if profit-maximizing outlets acted responsibly and did not engage in sensationalist or prejudging coverage due to of the potential effects on public opinion and verdicts.

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Tables and Figures

Table 1: Summary statistics of the main variables

Variable	Measurement	Mean	SD	Min.	Max.
Self-denunciations	amount	490.81	661.85	0.00	3440.00
Articles about celebrity tax evaders	amount	4.05	7.54	0.00	56.17
Disaster fatalities	amount	201.58	208.18	0.00	1166.24
Terror fatalities	amount	235.86	261.94	0.00	2055.24
Trial openings	amount	1.50	1.05	0.00	4.00
Trial closings	amount	1.37	1.25	0.00	5.00
Ongoing trials	amount	3.91	1.75	1.00	7.00
Tax investigations	amount	543.71	495.54	30.00	2174.00
Tax CD purchase	impulse dummy	0.04	0.20	0.00	1.00
Tax data leak	impulse dummy	0.17	0.38	0.00	1.00
Federal Court ruling 2010q2	shift dummy	0.98	0.15	0.00	1.00
Federal Constitutional Court ruling 2010q4	shift dummy	0.93	0.25	0.00	1.00

Notes: The data refer to a panel of 16 federal states, with up to 26 quarters per state.

Table 2: Effects of competing and non-competing news events

	(1) Self-den.	(2) Coverage	(3) Self-den.	(4) Coverage	(5) Self-den.	(6) Coverage
Competing events						
-disaster fatalities	-0.439***	-0.0130***			-0.476***	-0.0130***
	(0.155)	(0.00318)			(0.168)	(0.00294)
-terror fatalities	-0.430**	-0.00860***			-0.399**	-0.00915***
	(0.179)	(0.00266)			(0.191)	(0.00261)
Non-competing events						
-disaster fatalities			-0.00311	-0.0000273	-0.0000159	0.0000572
			(0.00429)	(0.0000442)	(0.00472)	(0.0000439)
-terror fatalities			0.0287	-0.000712	0.0303	-0.000574
			(0.0414)	(0.000778)	(0.0441)	(0.000703)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Quarter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.715	0.418	0.702	0.357	0.715	0.421

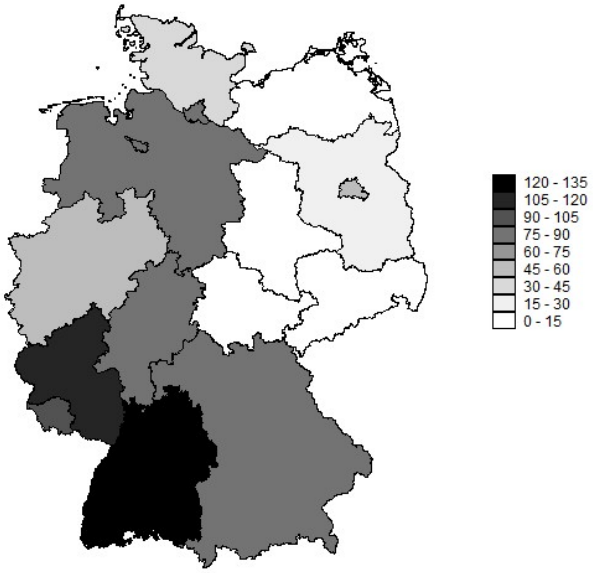
Notes: N = 207 (16 states, with up to 26 quarters per state). OLS estimates. All models include controls for tax CD purchases, major court rulings, tax data leaks, the overall amount of tax investigations, the number of trial openings and closings, the number of ongoing trials, a state-specific linear time trend, and a constant (output omitted). Autocorrelation- and heteroscedasticity-robust standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

Table 3: Effect of celebrity news coverage on self-denunciations

	(1) Self-den. (OLS)	(2) Coverage (OLS) 1st stage	(3) Self-den. (IV) 2nd stage
News coverage	13.13***		39.09***
	(4.603)		(10.15)
Disaster fatalities		-0.0130***	
		(0.00318)	
Terror fatalities		-0.00860***	
		(0.00266)	
State fixed effects	Yes	Yes	Yes
Quarter fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
F-statistic, 1st stage			14.14
Hansen's J, p-value			0.532
R-square	0.651	0.383	0.582

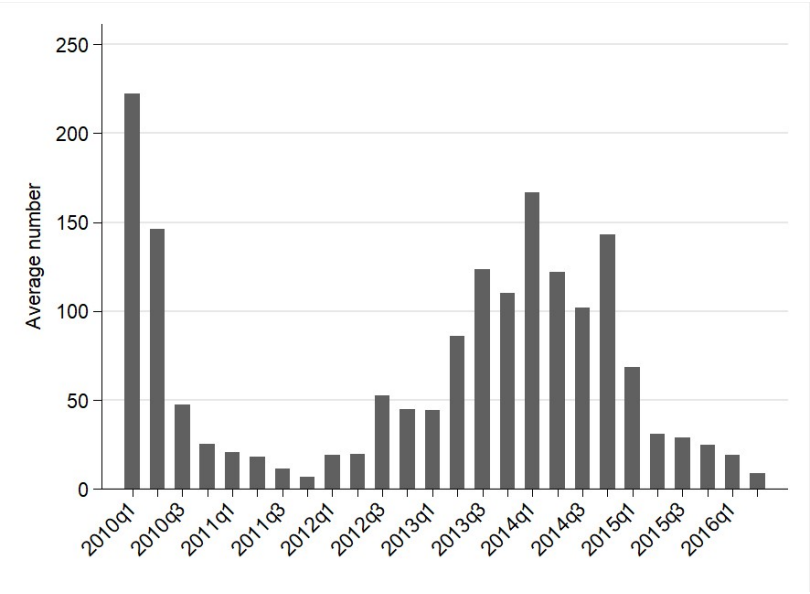
Notes: N = 207 (16 states, with up to 26 quarters per state). All models include controls for tax CD purchases, major court rulings, tax data leaks, the overall amount of tax investigations, the number of trial openings and closings, the number of ongoing trials, a state-specific linear time trend, and a constant (output omitted). Autocorrelation- and heteroscedasticity-robust standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

Figure 1: Amount of self-denunciations, by federal state



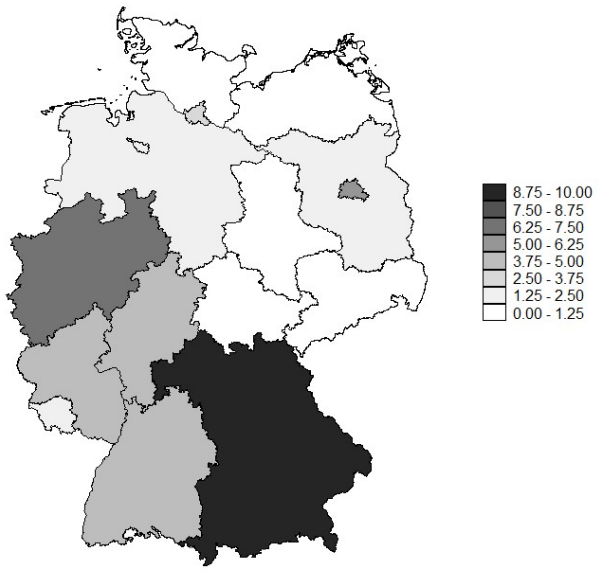
Notes: The figure shows the number of self-denunciations, per 1,000,000 inhabitants, averaged over time.

Figure 2: Amount of self-denunciations, over time



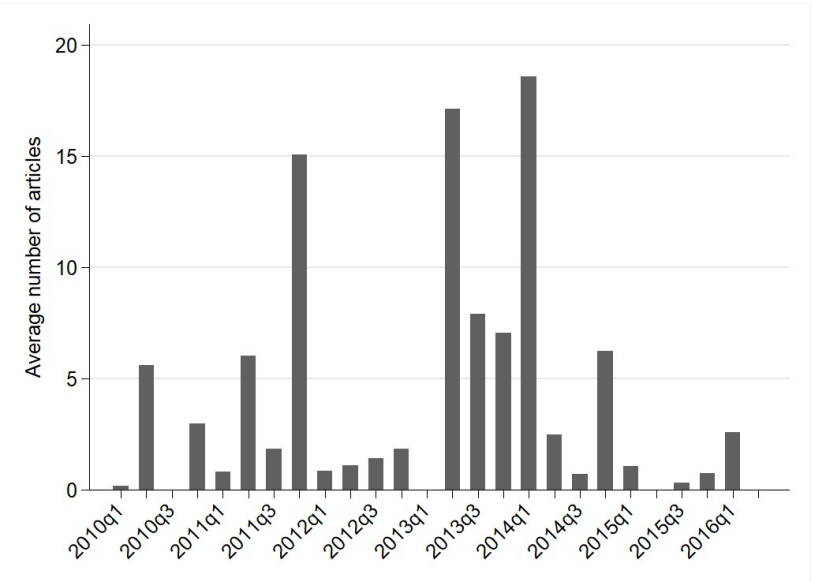
Notes: The figure shows the number of self-denunciations, per 1,000,000 inhabitants, averaged over the federal states.

Figure 3: Amount of news coverage, by federal state



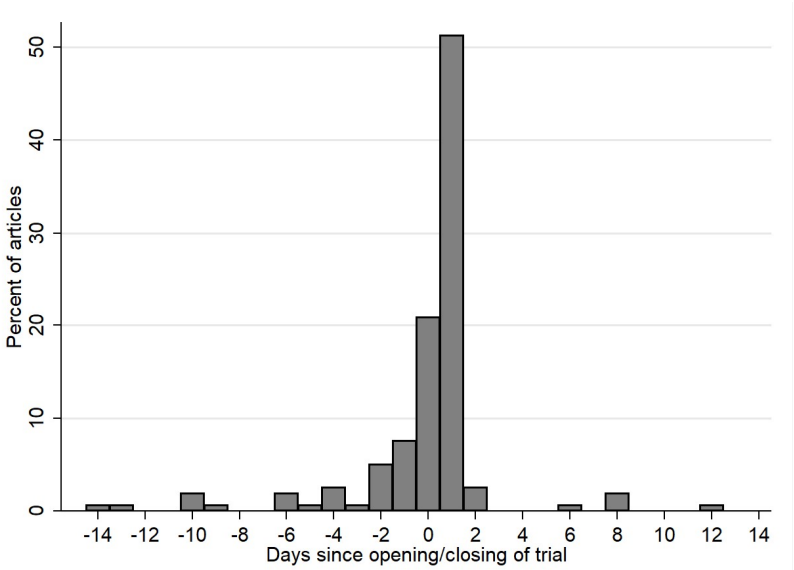
Notes: The figure shows the number of reports about tax evasion that contain the name of a Wikipedia celebrity in the (sub)heading, averaged over time.

Figure 4: Amount of news coverage, over time



Notes: The figure shows the number of reports about tax evasion that contain the name of a Wikipedia celebrity in the (sub)heading, averaged over the federal states.

Figure 5: Publication pattern of articles about celebrity tax evaders



Notes: The figure is based on article-level data. It shows the daily distribution of reports about tax evasion that contain the name of a Wikipedia celebrity in the (sub)heading, for a period of 14 days before and 14 days after the opening or closing of the trials.

Appendix

Table A1: Celebrities in public trials for tax evasion, January 2010 – June 2016

Name	Known for	Number of trials	Raw number of articles	Weighted number of articles
Acar, Mehmet	politician	1	0	0.00
Auermann, Nadja	model	2	30	45.28
Ehlert, Hans-Harald	CEO	2	3	11.24
Falk, Alexander	entrepeneur	1	0	0.00
Finzelberg, Lothar	politician	2	0	0.00
Fitschen, Jürgen	CEO	1	2	5.76
Ganswindt, Thomas	CEO	1	1	0.00
Gribkowsky, Gerhard	CEO	1	9	20.64
Haderthauer, Hubert	forensic physician	1	4	13.45
Herman, Eva	TV presenter	1	0	0.00
Hildebrandt, Bernd-Uwe	sports official	1	1	1.00
Hilpert, Axel	entrepeneur	3	0	0.00
Hoeneß, Uli	sports official	1	208	553.45
Inhofer, Karl	public servant	1	1	1.00
Kahn, Oliver	athlete	1	5	0.57
Lindner, Patrick	artist	1	0	0.00
Middelhoff, Thomas	CEO	1	11	18.70
Pischetsrieder, Bernd	CEO	1	10	47.22
Schelter, Kurt	politician	1	8	4.83
Schmid, Georg	politician	1	2	17.00
Schreiber, Karlheinz	lobbyist	3	30	64.20
Sommer, Theo	journalist	1	5	29.61
Speck, Karsten	artist	1	7	4.59
Strauss, Max Josef	entrepeneur	1	0	0.00
Tönnies, Clemens	sports official	1	1	1.00
Uckermann, Jörg	politician	1	0	0.00
Weiß, Roland	politician	1	0	0.00
Wildmoser, Karl-Heinz	sports official	1	0	0.00
Wolter, Judith	politician	1	0	0.00

Note: The table shows celebrity-level data. The weighted number of articles is greater than the raw number because it accounts for the newspapers' circulation and because the same article might appear in multiple states.

Table A2: List of newspapers in the sample

Newspaper	Circulation
Aachener Nachrichten	North Rhine-Westphalia
Aachener Zeitung	North Rhine-Westphalia
Allgemeine Zeitung Mainz	Rhineland-Palatinate
B.Z.	Berlin
Badische Zeitung	Baden-Wuerttemberg
Bayerische Rundschau	Bavaria
Berliner Kurier	Berlin
Berliner Morgenpost	Berlin
Berliner Zeitung	Berlin
Bonner General-Anzeiger	North Rhine-Westphalia
Coburger Tageblatt	Bavaria
Darmstädter Echo	Hesse
Der Tagesspiegel	Berlin, Brandenburg
Die Tageszeitung	national
Die Welt	national
Express	North Rhine-Westphalia
Frankfurter Allgemeine Zeitung	national
Frankfurter Neue Presse	Hesse
Frankfurter Rundschau	national
Gelnhäuser Tageblatt	Hesse
Gießener Anzeiger	Hesse
Hamburger Abendblatt	Hamburg, Lower Saxony, Schleswig-Holstein
Hamburger Morgenpost	Hamburg
Handelsblatt	national
Heilbronner Stimme	Baden-Wuerttemberg
Kölner Stadt-Anzeiger	North Rhine-Westphalia
Kölnische Rundschau	North Rhine-Westphalia
Lampertheimer Zeitung	Hesse
Lausitzer Rundschau	Brandenburg, Saxony
Lauterbacher Anzeiger	Hesse
Leipziger Volkszeitung	Saxony, Thuringia
Main Spitze	Hesse
Main-Post	Bavaria
Märkische Allgemeine	Brandenburg
Mitteldeutsche Zeitung	Saxony-Anhalt
Münchner Abendzeitung	Bavaria
Neue Westfälische	North Rhine-Westphalia
Neue Württembergische Zeitung	Baden-Wuerttemberg
Nordkurier	Mecklenburg-Western Pomerania
Nürnberger Nachrichten	Bavaria
Oberhessische Zeitung	Hesse
Ostthüringer Zeitung	Thuringia
Passauer Neue Presse	Bavaria
Potsdamer Neueste Nachrichten	Brandenburg
Reutlinger General-Anzeiger	Baden-Wuerttemberg
Rheinische Post	North Rhine-Westphalia
Rhein-Zeitung	Rhineland-Palatinate
Saarbrücker Zeitung	Saarland
Sächsische Zeitung	Saxony
Schweriner Volkszeitung	Mecklenburg-Western Pomerania
Süddeutsche Zeitung	national
Südkurier	Baden-Wuerttemberg
Südwest Presse	Baden-Wuerttemberg
Thüringer Allgemeine	Thuringia
Thüringische Landeszeitung	Thuringia
Trierischer Volksfreund	Rhineland-Palatinate
Usinger Anzeiger	Hesse
Westdeutsche Zeitung	North Rhine-Westphalia
Wiesbadener Kurier	Hesse
Wiesbadener Tagblatt	Hesse

Table A3: Most common words in tax evasion news coverage

#	Word	Translation	Freq.	#	Word	Translation	Freq.
1	Steuerhinterziehung	tax evasion	5882	51	Beihilfe	abetment	464
2	Euro	euro	4323	52	Angeklagte	accused	455
3	Hoeneß	Hoeneß	3062	53	Auermann	Auermann	448
4	deutsche	German	2888	54	Vorwürfe	accusations	446
5	Millionen	millions	2251	55	Gefängnis	prison	444
6	Staatsanwaltschaft	prosecution	1908	56	Steuersünder	tax evader	426
7	Steuern	taxes	1795	57	Ermittler	investigator	422
8	Bank	bank	1438	58	Anwalt	lawyer	419
9	Gericht	court	1293	59	Steuerfahnder	tax investigator	419
10	Schweiz	Switzerland	1206	60	Firma	firm	401
11	Deutschland	Germany	1199	61	Post	mail	401
12	Selbstanzeige	self-denunciation	1199	62	Verdachts	suspicion	369
13	deutschen	German	1192	63	Fahnder	investigator	361
14	Geld	money	1184	64	Konto	account	357
15	schweizer	swiss	1085	65	Januar	January	354
16	München	Munich	1045	66	Selbstanzeigen	self-denunciations	353
17	Uli	Uli	1031	67	Regierung	government	349
18	Ermittlungen	investigations	995	68	Bewährung	probation	347
19	Politik	politics	924	69	Staatsanwalt	prosecutor	342
20	Bayern	Bavaria	864	70	Wolfgang	Wolfgang	338
21	Finanzamt	tax authority	853	71	USA	USA	337
22	Prozess	trial	825	72	Schwarzer	Schwarzer	334
23	Anklage	indictment	803	73	Monate	months	333
24	Urteil	verdict	802	74	CDU	CDU	329
25	Verfahren	process	799	75	Million	million	321
26	Berlin	Berlin	790	76	Sprecher	spokesperson	321
27	Fiskus	revenue board	774	77	Justiz	justice	320
28	Richter	judge	715	78	Luxemburg	Luxembourg	317
29	Banken	banks	701	79	Vorwurf	accusation	313
30	Kunden	customers	665	80	Razzia	raid	310
31	Frankfurt	Frankfurt	664	81	März	March	308
32	verurteilt	sentenced	641	82	Präsident	president	306
33	hinterzogen	evaded	611	83	Thomas	Thomas	306
34	Prozent	percent	603	84	Millionenhöhe	into the millions	304
35	Milliarden	billions	591	85	Konten	accounts	302
36	Staat	state	570	86	Verteidiger	defense lawyer	302
37	Landgericht	regional court	558	87	Koch	Koch	299
38	Zeit	time	556	88	Manager	manager	299
39	Daten	data	555	89	Dienstag	Tuesday	293
40	Haft	imprisonment	552	90	Finanzminister	minister of finance	293
41	ermittelt	investigates	535	91	Informationen	information	289
42	Angeklagten	accused	522	92	Münchner	Munich	289
43	Verdacht	suspicion	518	93	Woche	week	289
44	Behörden	authorities	516	94	Mai	May	288
45	Monaten	months	513	95	Geldstrafe	fine	287
46	Unternehmen	company	498	96	Geschäfte	business dealings	287
47	SPD	SPD	497	97	Amtsgericht	local court	285
48	Steuerhinterzieher	tax defrauder	494	98	Sommer	Sommer	284
49	Mitarbeiter	employee	483	99	später	later	283
50	Strafe	sentence	470	100	Unterlagen	documents	280

Notes: Based on all articles containing the word "Steuerhinterziehung" in the (sub)heading. Word counts obtained after removing stop words, punctuation, and numbers.

Table A4: Major changes and events affecting the tax evasion environment

Event	Region	Time
Tax CD		
purchase	North Rhine-Westphalia	2010q1
consideration	Bavaria	2010q1
purchase	Lower Saxony	2010q2
purchase	North Rhine-Westphalia	2010q2
purchase	North Rhine-Westphalia	2010q4
purchase	North Rhine-Westphalia	2011q4
purchase	North Rhine-Westphalia	2012q3
purchase	Saarland	2012q2
purchase	Rhineland-Palatinate	2012q4
purchase	North Rhine-Westphalia	2013q4
purchase	North Rhine-Westphalia	2014q4
consideration	Berlin	2016q1
Court rulings		
Federal Court	national	as of 2010q2
Federal Constitutional Court	national	as of 2010q4
Leaks		
Swiss Leaks I	national	2010q1
Luxembourg Leaks	national	2012q2
Offshore Leaks	national	2013q2
Swiss Leaks II	national	2015q1

Table A5: Timing of public trials and occurrence of disasters and terrorist attacks

	Dependent variable: daily number of trial openings/closings			
	(1)	(2)	(3)	(4)
Disaster fatalities (thousand), t	-0.000118	-0.000119		
	(0.000823)	(0.000824)		
t-1		-0.000128		
		(0.000824)		
t-2		-0.000133		
		(0.000824)		
t+1		-0.000226		
		(0.000824)		
t+2		-0.00000520		
		(0.000824)		
Terror fatalities (thousand), t			-0.0257	-0.00624
			(0.0632)	(0.0647)
t-1				0.0153
				(0.0640)
t-2				-0.0587
				(0.0640)
t+1				-0.0378
				(0.0640)
t+2				-0.0792
				(0.0641)
R-square	0.0134	0.0136	0.0135	0.0147
Observations	2373	2369	2373	2369

Notes: OLS estimates, using daily observations between January 2010 and June 2016. All models include weekday, quarter, and year fixed effects. Standard errors (in parentheses) are robust to arbitrary autocorrelation up to order 14.
* p<0.10, ** p<0.05, *** p<0.01

Table A6: Effect of celebrity news coverage on self-denunciations (alternative construction of the instrument)

	(1) Coverage (OLS) 1st stage	(2) Self-den. (IV) 2nd stage	(3) Coverage (OLS) 1st stage	(4) Self-den. (IV) 2nd stage
News coverage		33.34***		22.37**
		(10.12)		(10.92)
Disaster fatalities, 5-day window	0.000982			
	(0.00150)			
Terror fatalities, 5-day window	-0.0117***			
	(0.00209)			
Fatalities, only disasters in Germany			-11.23***	
			(1.831)	
State fixed effects	Yes	Yes	Yes	Yes
Quarter fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
F-statistic, 1st stage		13.32		31.45
Hansen's J, p-value		0.103		
R-square	0.402	0.609	0.371	0.643

Notes: N = 207 (16 states, with up to 26 quarters per state). All models include controls for tax CD purchases, major court rulings, tax data leaks, the overall amount of tax investigations, the number of trial openings and closings, the number of ongoing trials, a state-specific linear time trend, and a constant (output omitted). Autocorrelation- and heteroscedasticity-robust standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

Table A7: Effect of celebrity news coverage on self-denunciations (including disasters and terrorist attacks separately)

	(1) Coverage (OLS) 1st stage	(2) Self-den. (IV) 2nd stage	(3) Coverage (OLS) 1st stage	(4) Self-den. (IV) 2nd stage
News coverage		33.53**		50.51**
		(13.08)		(24.09)
Disaster fatalities	-0.0128***			
	(0.00320)			
Terror fatalities			-0.00831***	
			(0.00269)	
State fixed effects	Yes	Yes	Yes	Yes
Quarter fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
F-statistic, 1st stage		13.35		7.948
R-square	0.360	0.609	0.337	0.508

Notes: N = 207 (16 states, with up to 26 quarters per state). All models include controls for tax CD purchases, major court rulings, tax data leaks, the overall amount of tax investigations, the number of trial openings and closings, the number of ongoing trials, a state-specific linear time trend, and a constant (output omitted). Autocorrelation- and heteroscedasticity-robust standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

Table A8: Effect of celebrity news coverage on self-denunciations (alternative selection of celebrities)

	(1)	(2)	(3)	(4)
	Excluding the case of Uli Hoeneß		Munzinger celebrity criterion	
	Coverage (OLS) 1st stage	Self-den. (IV) 2nd stage	Coverage (OLS) 1st stage	Self-den. (IV) 2nd stage
News coverage		102.2***		44.86***
		(33.64)		(14.28)
Disaster fatalities	-0.00495***		-0.0569**	
	(0.00128)		(0.0196)	
Terror fatalities	-0.00293***		-0.0234***	
	(0.000989)		(0.00432)	
State fixed effects	Yes	Yes	Yes	Yes
Quarter fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
F-statistic, 1st stage		9.064		12.92
Hansen's J, p-value		0.459		0.297
R-square	0.355	0.477	0.406	0.562

Notes: N = 207 (16 states, with up to 26 quarters per state). All models include controls for tax CD purchases, major court rulings, tax data leaks, the overall amount of tax investigations, the number of trial openings and closings, the number of ongoing trials, a state-specific linear time trend, and a constant (output omitted). Autocorrelation- and heteroscedasticity-robust standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

Table A9: Effect of celebrity news coverage on self-denunciations (shifting articles from the last three weeks of a quarter to the next quarter)

	(1) Coverage (OLS) 1st stage	(2) Self-den. (IV) 2nd stage
News coverage		49.62***
		(17.96)
Disaster fatalities	-0.00506**	
	(0.00217)	
Terror fatalities	-0.00932***	
	(0.00265)	
State fixed effects	Yes	Yes
Quarter fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
F-statistic, 1st stage		9.231
Hansen's J, p-value		0.504
R-square	0.427	0.556

Notes: N = 207 (16 states, with up to 26 quarters per state). All models include controls for tax CD purchases, major court rulings, tax data leaks, the overall amount of tax investigations, the number of trial openings and closings, the number of ongoing trials, a state-specific linear time trend, and a constant (output omitted). Autocorrelation- and heteroscedasticity-robust standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

Table A10: Effect of celebrity news coverage on self-denunciations (with lagged dependent variable)

	(1) Coverage (OLS) 1st stage	(2) Self-den. (IV) 2nd stage
News coverage		29.35***
		(9.329)
Disaster fatalities	-0.0133***	
	(0.00376)	
Terror fatalities	-0.00852***	
	(0.00293)	
Self-den. (t-1)	-0.000754	0.566***
	(0.000869)	(0.107)
State fixed effects	Yes	Yes
Quarter fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
F-statistic, 1st stage		11.91
Hansen's J, p-value		0.692
R-square	0.355	0.751

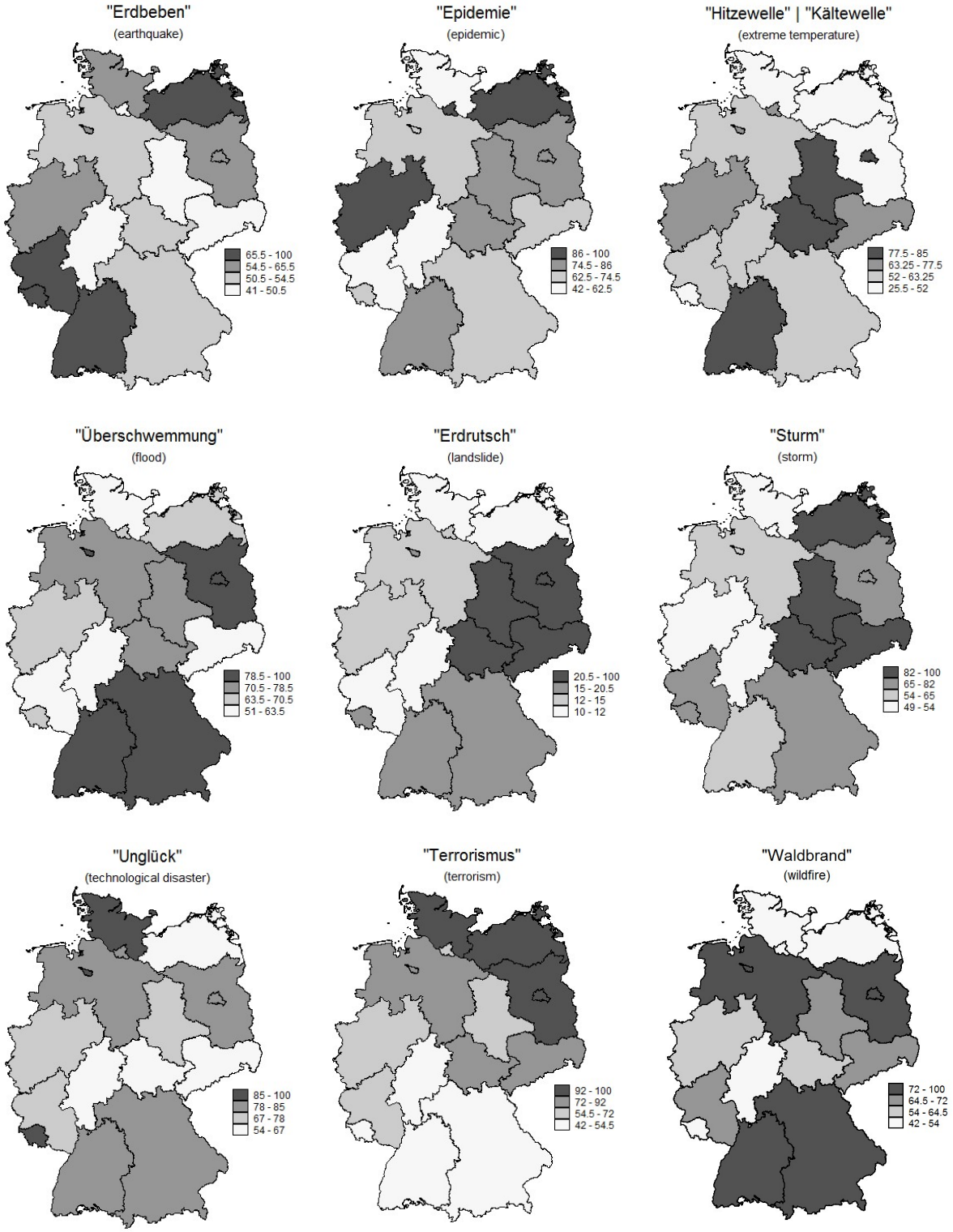
Notes: N = 186 (16 states, with up to 26 quarters per state). All models include controls for tax CD purchases, major court rulings, tax data leaks, the overall amount of tax investigations, the number of trial openings and closings, the number of ongoing trials, a state-specific linear time trend, and a constant (output omitted). Autocorrelation- and heteroscedasticity-robust standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

Table A11: Effect of celebrity news coverage on self-denunciations (alternative calculation of standard errors)

	(1)	(2)	(3)	(4)
	Robust to heteroscedasticity		Clustered by state	
	Coverage (OLS) 1st stage	Self-den. (IV) 2nd stage	Coverage (OLS) 1st stage	Self-den. (IV) 2nd stage
News coverage		39.09***		39.09***
		(12.23)		(10.29)
Disaster fatalities	-0.0130***		-0.0130***	
	(0.00348)		(0.00186)	
Terror fatalities	-0.00860***		-0.00860***	
	(0.00243)		(0.00199)	
State fixed effects	Yes	Yes	Yes	No
Quarter fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
F-statistic, 1st stage		14.04		24.00
Hansen's J, p-value		0.566		0.405
R-square	0.383	0.582	0.383	0.291

Notes: N = 207 (16 states, with up to 26 quarters per state). All models include controls for tax CD purchases, major court rulings, tax data leaks, the overall amount of tax investigations, the number of trial openings and closings, the number of ongoing trials, a state-specific linear time trend, and a constant (output omitted). Standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

Figure A1: Relative frequency of Google search terms, 2005 – 2009



Notes: Google Trends data. Based on the number of keyword searches relative to the entire search volume in a federal state, each panel compares the frequency of a search term across states (in %). A value of 100% implies that a state had the largest search volume; lower values denote the other states' fraction of this value.

Figure A2: Self-denunciations and news coverage

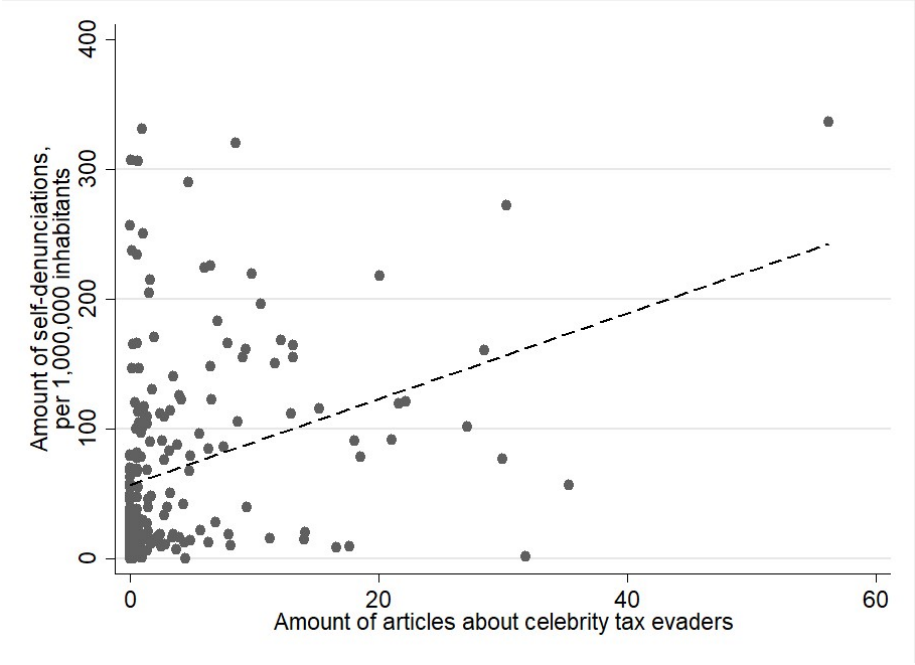
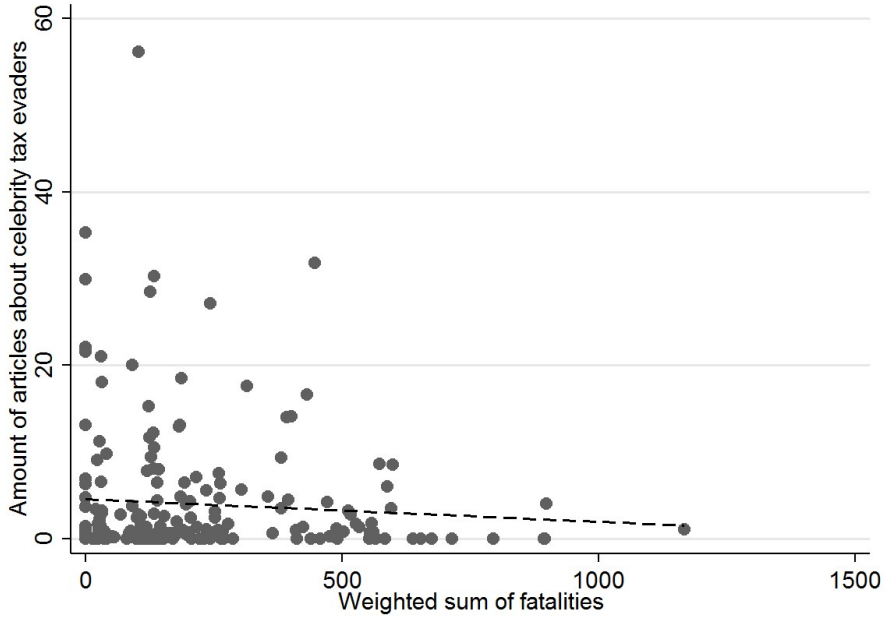


Figure A3: News coverage and competing events

(a) disasters



(b) terrorist attacks

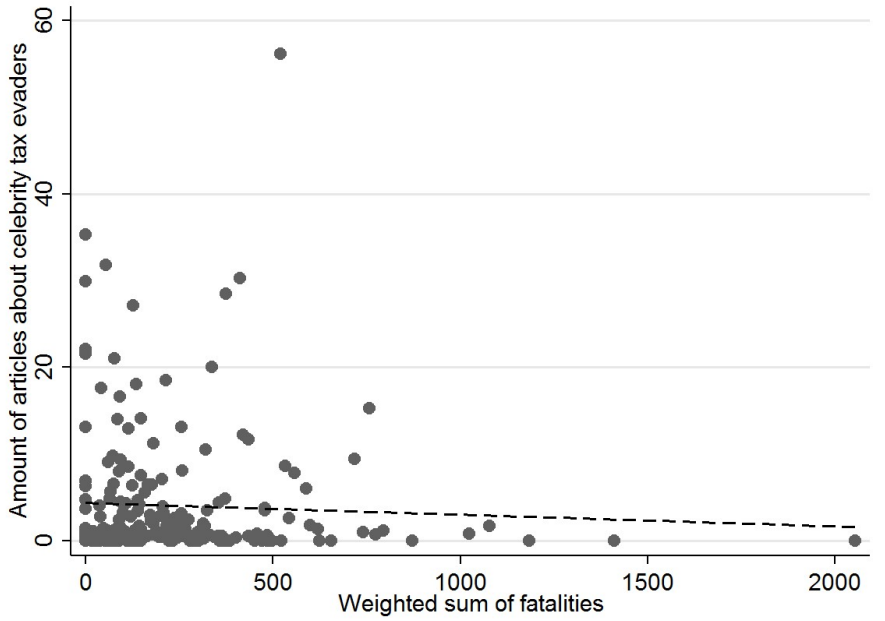
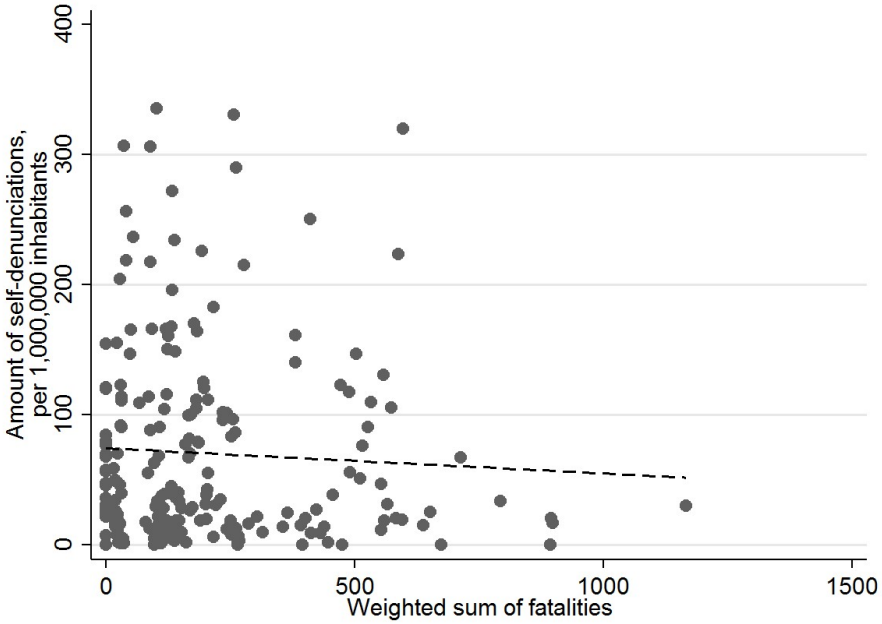


Figure A4: Self-denunciations and competing events

(a) disasters



(b) terrorist attacks