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## **SHAMING FOR TAX ENFORCEMENT: EVIDENCE FROM A NEW POLICY**

Nadja Dwenger and Lukas Treber

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## Abstract

Many tax authorities make ample use of public shaming, mainly to enforce tax payments. However, our understanding of the policy is very limited. It is unclear whether public shaming affects corporations, which account for the bulk of unpaid taxes, and whether previously compliant taxpayers are adversely affected. This paper makes progress on these questions by exploiting comprehensive administrative tax data and the introduction of a novel naming-and-shaming policy in Slovenia in 2012 as a natural experiment. The policy affected both individuals and corporations. It was announced four months before its implementation, which allows us to separate responses to the threat of shaming from responses to actual shaming. We show that corporations reduce their tax debt by 8.5% in response to the threat of shaming, particularly in industries where reputational concerns are likely to be important. Individuals reduce their tax debt by 5%. The publication of the first naming-and-shaming list further reduces tax debt among shamed taxpayers. This effect, however, is marginal in terms of revenue and tapers off quickly. Previously compliant taxpayers remain compliant throughout.

JEL Classification: H26, D1, K34, K42, Z13

Keywords: compliance, tax debt, shaming, enforcement, social image concerns, penalty

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# Shaming for Tax Enforcement: Evidence from a New Policy

December 3, 2019

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## Abstract

Many tax authorities make ample use of public shaming, mainly to enforce tax payments. However, our understanding of the policy is very limited. It is unclear whether public shaming affects corporations, which account for the bulk of unpaid taxes, and whether previously compliant taxpayers are adversely affected. This paper makes progress on these questions by exploiting comprehensive administrative tax data and the introduction of a novel naming-and-shaming policy in Slovenia in 2012 as a natural experiment. The policy affected both individuals and corporations. It was announced four months before its implementation, which allows us to separate responses to the threat of shaming from responses to actual shaming. We show that corporations reduce their tax debt by 8.5% in response to the threat of shaming, particularly in industries where reputational concerns are likely to be important. Individuals reduce their tax debt by 5%. The publication of the first naming-and-shaming list further reduces tax debt among shamed taxpayers. This effect, however, is marginal in terms of revenue and tapers off quickly. Previously compliant taxpayers remain compliant throughout.

**Keywords** compliance · tax debt · shaming · enforcement · reputational concerns · social pressure · penalty

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## 1. Introduction

The question whether the public spotlight is an effective measure to achieve policy goals is at the heart of an ongoing debate in the tax compliance literature (e.g., [Slemrod 2018](#); [Luttmer and Singhal 2014](#)). If reputational concerns or behaviors of others influence taxpayers' compliance decisions, it may be attractive for tax authorities to revert to a cost-effective instrument that has historically been common in societies in other contexts: public shaming.

One half of tax administrations in the OECD have the power to publish the names of non-compliant taxpayers and nearly 90% thereof frequently or infrequently use this power ([OECD 2017](#), p.109 et seq.). Tax administrations use public shaming for tax debt enforcement in particular.<sup>1</sup> Despite the ample use of shaming by tax authorities, our understanding of the shaming policy is surprisingly limited. The only existing field study shows that shaming can improve tax payment behavior among individuals ([Perez-Truglia and Troiano 2018](#)). However, the effect of shaming on individuals alone is not sufficient to assess the overall impact of introducing public shaming on tax revenue. Individuals account for a small share of tax debt only; the bulk of tax debt belongs to corporations. In addition, shaming may negatively affect the payment behavior of previously compliant taxpayers. Yet, whether corporations and previously compliant taxpayers respond to public shaming is so far unexplored.

We study a new policy that shames corporations and individuals with outstanding tax debt on the Internet. Specifically, we analyze the introduction of public shaming in Slovenia. In 2012, the Slovenian government passed a law to name-and-shame all taxpayers with tax debt over €5,000 that is more than 90 days overdue (“delinquent taxpayers”) starting in 2013. Our empirical analysis exploits five unique features of this natural experiment. First, the shaming law affected individuals and corporations likewise. This allows us to provide empirical evidence on corporations and to compare the responses of individuals and corporations. Corporations account for the greater part of tax debt and, in the end, their response to public shaming determines whether the policy is a cost-effective instrument for tax enforcement. Second, public shaming is a new action, which allows us to study the effect on both delinquent and compliant taxpayers. Earlier literature made existing shaming policies more salient, but had to focus on already shamed taxpayers only. Yet, shaming can backfire among previously compliant taxpayers if it informs that others are non-compliant ([Gino et al. 2009](#); [Blaufus et al. 2017](#)) or crowds out their intrinsic motivation ([Bénabou and Tirole 2003](#); [Boyer et al. 2016](#)). Studying a new policy and the entire population of taxpayers provides

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<sup>1</sup>This makes shaming the fourth most used instrument of tax debt enforcement ([OECD 2017](#)). Figure [A.1](#) provides an overview of its worldwide use for tax enforcement. The popularity of shaming is not limited to tax compliance. There are numerous examples from different areas of policy, including the naming-and-shaming of water wasters (South Africa), sex offenders (United States), and speeding drivers (Australia) (see, for instance, [Pawson 2002](#)). Related are transparency policies that reveal the behavior of every entity involved. Transparency policies include public health initiatives where each restaurant has to display its most recent rating of the government hygiene inspection. [Fung et al. \(2007\)](#) discuss the advantages and disadvantages of transparency policies.

the full picture of responses, which is necessary to evaluate the policy. In particular, it allows us to assess whether tax authorities can increase net tax collection by public shaming. Third, the shaming policy was announced four months before its implementation. The delayed implementation allows us to separate behavioral responses to the *threat of shaming* (after the adoption of the law but before the implementation of the policy) from behavioral responses to *actual shaming* (after the publication of the first shaming list). By distinguishing between these two channels, we can speak to what actually makes the policy work. A response to the *threat of shaming* implies that taxpayers have been aware of the social norm of paying taxes on time but failed to comply, implying that the shaming law increases compliance with an existing social norm. By contrast, a response to *actual shaming* suggests that the shaming law is able to change the social norm. Understanding the relative importance of both channels also has important implications for welfare and the optimal design of the policy: If the threat of shaming already triggers compliance, this makes shaming more attractive to tax authorities as they do not need to impose further penalties, which are costly in terms of both money and welfare. Fourth, the Slovenian shaming list is published on the Internet, receiving wide public attention. Hence, shaming is highly visible. The digital shaming list provides an excellent example of how the availability of new technologies provides new opportunities for tax administrations to tackle non-compliance (OECD 2019). Fifth, the Slovenian tax administration shames taxpayers with outstanding tax debt. As we have access to the administrative payment data and to the records of outstanding tax debt, we can perfectly observe any payment response to the shaming incentive and assess the magnitude of the increase in tax revenue.

Our main empirical findings are as follows. First, both corporations and individuals significantly reduce their tax debts to avoid shaming. In response to the *threat of shaming* corporations reduce their tax debt by 8.5% on average. This corresponds to €23 million of extra tax revenue (or 4% of annual CIT revenue). Self-employed individuals reduce their tax debt by 5%, which is equal to extra tax revenue of €0.5 million. These amounts are additionally collected (and not just brought forward). The estimates are a lower bound of the long-term effects of the shaming policy: the policy shifts payment behavior to a new equilibrium and therefore affects all future taxes assessed (which become collectable under the new equilibrium but would have been uncollectable before). The strong response to the threat of shaming suggests that taxpayers have been aware of the social norm of paying taxes on time but failed to comply. It also implies that reputational concerns and social pressure are important determinants of tax compliance, complementing the standard toolbox of tax authorities.

Second, the response to the threat of shaming is strongly heterogeneous in the population. The social costs of shaming are larger for corporations in industries with high reputational concerns (selling to end customers), in non-exporting industries that heavily depend on the domestic market, for micro corporations

in which responsibilities are less distributed, and for particularly large corporations that are more in the public eye. We find that these corporations respond most to the policy. Potentially, the shaming policy thus entails significant distributional consequences.

Third, *actual shaming* further reduces tax debt among shamed taxpayers. The publication of the first shaming list lowers corporations' tax debts by another 3.2%. However, this effect is short-lived and restricted to the first shaming list. We estimate that actual shaming lead to a one-time increase of tax revenue among corporations of €2.1 million. Compared with the additional tax revenue that was collected in response to the shaming threat, the revenue effects from actual shaming are modest. The fluctuation on the shaming list is low: 96% of the tax delinquents shamed on the second shaming list already featured on the first list. We provide evidence that financial constraints are important among the shamed tax delinquents. Put differently, a significant fraction of shamed taxpayers are unable to pay their tax debt as opposed to simply unwilling. A shaming law may thus entail significant welfare losses when financial constraints are important.

Fourth, individuals and corporations that paid their tax debt on time prior to the shaming law continue to do so after the implementation of the law. That is, contagion effects are absent. This finding is consistent with either little new information conveyed by the shaming list or the presence of a “duty to comply” (Dwenger et al. 2016).

To identify the effect of the shaming threat we exploit that taxpayers were heterogeneously affected by the shaming law, although it was fully applicable to all taxpayers. Specifically, we take advantage of the fact that taxpayers had different debt histories before the shaming law. Think of taxpayers who seldom incurred tax debt as they predominantly paid new tax items on time. They hardly have to change behavior to avoid shaming. Now contrast these taxpayers to taxpayers that had tax debt on many occasions. These taxpayers can only avoid shaming if they significantly adjust their payment habits. To identify the threat of shaming impact, we thus exploit the variation in ex ante exposure to the policy. Our empirical strategy is to compare changes in tax debt among taxpayers with high exposure to the shaming law with those among taxpayers with low exposure.<sup>2</sup> Exposure is measured by the share of days on which a taxpayer would have been shamed on a hypothetical shaming list before the introduction of the shaming law (“shaming probability”). Ex ante individual shaming probabilities are, of course, not randomly assigned. A causal effect can be identified when the following two assumptions hold. First, in the absence of the shaming law, any baseline

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<sup>2</sup>Comparable difference-in-differences approaches have been used in other contexts by e.g., [Rajan and Zingales \(1998\)](#), [Finkelstein \(2007\)](#), [Mian and Sufi \(2012\)](#), and [Fort \(2017\)](#).

differences would have continued on the same trend. Second, there should be no selection into treatment. We provide supportive evidence for the plausibility of both assumptions.<sup>3</sup>

We also explore the dynamics of the threat of shaming by estimating event studies for the weeks before and after the adoption of the shaming law. While we find point estimates very close to zero before the adoption, very large negative point estimates after the adoption of the shaming law indicate a sharp drop in tax debt due to the threat of shaming. We complement our event study and difference-in-differences approaches by a regression discontinuity analysis. This regression discontinuity design exploits the treatment variation caused by the shaming threshold of €5,000. It reveals that the (affected) corporations just to the right of the shaming threshold indeed reduce their tax debt more strongly than the (unaffected) corporations to the left of the threshold.

Actual shaming is unlikely to be an effective tool for reducing tax debt if taxpayers form correct expectations about the social costs of shaming. Only if the social costs are larger than anticipated, can actual shaming lead some of the first unwilling tax delinquents to engage in social learning and to pay their tax debt.<sup>4</sup> Social learning may happen if there are fewer tax delinquents shamed than expected (signaling a stronger social norm) or if naming-and-shaming entails graver social costs (such as broader media coverage or greatly impaired reputation with customers) among shamed tax delinquents. Importantly, only the tax debts of shamed taxpayers become public information, while the tax debts of non-shamed taxpayers remain private information under the shaming law. This implies that non-shamed taxpayers can learn from observing shamed taxpayers (but not the other way around). To gauge the impact of actual shaming, we relate the extent of social learning within a certain region and industry sector to individual changes in tax debt among shamed tax delinquents. We measure social learning among non-shamed taxpayers to avoid endogeneity. Our approach yields a causal effect if the common trend assumption holds. In our context, this states that the change in the tax debts of shamed delinquents would have been the same in industries with little and with significant social learning in the absence of the shaming law. Implicitly, this requires the pre-period differences in the inflow of new tax items to continue on the same trends. Indeed, we show that new tax items smoothly evolve for industries with little and with significant social learning in our observation period from 2012 to 2013.

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<sup>3</sup>The shaming law also has an expressive value (Sunstein 1996; Kahan 1997; Posner 1998, 2000, 2002; Bénabou and Tirole 2011). That is, by passing the shaming law, the government sends a signal to all taxpayers that having tax debt violates a social norm and will be punished. Since our identification approach does not capture any effect of the shaming law on all taxpayers, our estimates provide a lower bound of the full impact of the threat of shaming.

<sup>4</sup>Expectation interactions through observational learning may cause social externalities of incurring tax debt (Manski 2000). A natural question is whether social learning can be leveraged for policy (BenYishay and Mobarak 2019), particularly for fostering tax compliance (DelCarpio 2014).

The closest paper to ours is [Perez-Truglia and Troiano \(2018\)](#), who show that shaming can work on individuals.<sup>5</sup> In their experiment, shamed tax debtors receive a letter signed by the researchers, which refers to the public records from the tax departments and features 10 individual tax debtors and their tax debt amounts. In a high visibility treatment, tax debtors on the shaming list are informed that their household “and other households in your area” receive the letter. In a low visibility treatment recipients are informed to be the only household in the area receiving the letter. Raising the visibility of tax debtors among neighbors increases the probability of leaving the shaming list by individuals with tax debts below \$2,500, but has no effect on individuals with larger debt amounts. While [Perez-Truglia and Troiano \(2018\)](#) exclusively study individuals who were already shamed under an existing shaming law, we take advantage of the introduction of a new shaming law. Our paper provides evidence on both corporations and the overall population of individuals, including previously compliant taxpayers. We can thus estimate the total effect of shaming tax delinquents on tax revenue, which is important for tax authorities considering the policy. In addition, our setting allows to provide evidence on heterogenous treatment responses and thus on distributional effects of the policy.

Our study also connects to the literature on public disclosure. Evidence in [Brockmeyer et al. \(2019\)](#) suggests that merely publishing the names of non-filers increases the filing rate. In Norway, information for individuals on income, wealth, and income and wealth taxes paid has been available on the Internet since 2001. Before 2001, the tax information was easily accessible in some but not all local areas. [Bø et al. \(2015\)](#) exploit the variation in accessibility over time and across space to identify how public disclosure impacts the income reported by individuals. They find that business owners significantly increase reported income when tax information is made available on the Internet. The study by [Hasegawa et al. \(2013\)](#) draws our attention to potential costs of making information public. They find that with a threshold for disclosure a significant number of individual and corporate taxpayers underreport taxable income to avoid disclosure. [Dyreg and Wilde \(2016\)](#) exploit a shock to the public scrutiny of firm subsidiary locations and show that public scrutiny increases the number of subsidiary location disclosures and, in particular, corporations’ effective tax rates. They further describe disproportionately higher levels of tax haven usage for previously non-disclosed subsidiary locations and conclude that public scrutiny leads to a decrease in tax avoidance. All of these papers show that public information has real consequences. Yet, public disclosure affects taxpayers

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<sup>5</sup>This is in line with findings from the laboratory. [Coricelli et al. \(2010\)](#) study the impact of shaming on compliance. They find that both the number of evaders and the amount of tax evaded reduce significantly if a picture of detected evaders is displayed to all group members. Public shaming of evaders acts as a deterrent to tax evaders both in Italy and in the US, despite what appear to be different social norms for tax compliance in the countries studied ([Alm et al. 2017](#)). In a public goods experiment, [Jacquet et al. \(2012\)](#) demonstrate that the threat of shaming (being publicly exposed as one of the two least generous group participants) increases cooperation. Another set of laboratory experiments find that revealing the identity of participants affects cooperation in public goods games (e.g. [Gächter and Fehr 1999](#); [Andreoni and Petrie 2004](#); [Rege and Telle 2004](#)).

both with legal and with illegal behavior. We contribute to the literature by studying a context where only unlawful behavior is put into the spotlight and where we can observe how this behavior changes in response.

The remainder of this paper is structured as follows. Section 2 provides an overview of the institutional details and introduces our data set. Section 3 explains our empirical strategy. In sections 4 and 5, we present our empirical results on the threat of shaming and on actual shaming, respectively. Section 6 discusses how previously compliant taxpayers are affected by the policy, and section 7 concludes.

## 2. Institutions and Data

### 2.1. Institutional Background

The Slovenian tax system comprises direct taxes on income, direct taxes on property, and indirect taxes (Schellekens et al. 2017). During our observation period, all taxes and social security contributions were collected by the tax administration of Slovenia.<sup>6</sup> While personal income taxes are collected by withholding during the year, corporate income and value added are taxed in a self-assessment regime.<sup>7</sup> In addition, self-employed individuals and corporations are obliged to remit social security contributions, which are considered tax debt if unpaid. The self-assessment regime for the self-employed and for corporations opens up the possibility to accumulate significant tax debt, which is the focus of our study. Unlike employed individuals, corporations and the self-employed are not subject to withholding and can easily defer the payment of their tax bills. Corporations account for 80% of tax debt and the self-employed for 7.5%.<sup>8</sup> In our analysis, we focus on these taxpayers to study whether naming-and-shaming can affect their tax debts.

The Slovenian tax administration sends out a payment reminder for each tax issue one week after the payment deadline has passed. Thus, inattention or uncertainty about how much to pay cannot explain the high tax debt levels. Instead, the tax administration deplores a “lack of payment discipline” (Republic of Slovenia, Ministry of Finance 2011). All the available instruments of tax debt enforcement have turned out to be ineffective. For instance, as Slovenia is a small country, taxpayers have opened a bank account in neighboring Austria or Italy (which are also part of the Eurozone) to escape income garnishment.<sup>9</sup> To recover tax debts that otherwise were uncollectable, the Slovenian parliament passed a shaming law in

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<sup>6</sup>On August 1, 2014, the tax administration and customs administration merged to create the financial administration that has since collected all taxes and duties.

<sup>7</sup>Payments for corporate income tax and value added tax must be made in advance on a quarterly or monthly basis (depending on the size of the business). Other than that, the payment deadline is 30 days after the tax assessment. Various penalties are imposed for not correctly filing a required tax return (again depending on size).

<sup>8</sup>Remaining tax debt among employed individuals can be attributed to single events such as inheritance or acquisition of property.

<sup>9</sup>Some countries can withhold government payments to a delinquent taxpayer, deny access to certain government services, temporarily close a business or withdraw a license, and impose liability on company directors for certain company tax debts (OECD 2017, Tables A.125 and A.126). These instruments are uncommon in Slovenia.

November 2012. This law allows the tax administration to name-and-shame taxpayers with tax debt over €5,000 that is overdue for more than 90 days (“old tax debt”). We refer to these taxpayers as “delinquent taxpayers.”

To determine delinquent taxpayers, tax authorities assess total old tax debt on the 25<sup>th</sup> of each month. In the following month (between the 10<sup>th</sup> and 15<sup>th</sup>), the tax administration then publishes the names, addresses and tax identification numbers of all delinquent taxpayers on its website.<sup>10</sup> The published information on corporations also includes the names and addresses of beneficial owners who directly or indirectly own shares or stocks that represent more than 25% of a corporation’s share capital. The published information unambiguously identifies taxpayers. Thus, social pressure and reputational concerns may be at play when both the self-employed and (the beneficial owners of) corporations respond to the shaming policy.<sup>11</sup> The shaming list does not display individual tax debts but arranges taxpayers into tax debt amount categories.<sup>12</sup> The published information is not updated between months. That is, delinquent taxpayers are shamed for one full month (or longer). The shaming list is published as an unarchived image (which remains unscanned by search engines) and it is forbidden by law to generate a database from the published shaming lists. As a consequence, taxpayers can retreat from the public eye by paying their debt. The following five institutional features are central to our study.

First, shaming is a new action. Until 2012, the Slovenian tax administration only used classical debt collection measures such as interest and fines for late payments.<sup>13</sup> Before the first shaming list, tax collection did not involve any social incentives for taxpayers: individual tax payment behavior was private information and unobservable to others. Hence, the shaming law provides a large shift in social incentives that we can exploit as a natural experiment in our empirical analysis. This overcomes the small incentives problem inherent in earlier studies (Luttmer and Singhal 2014): those were confined to either study changes in the salience of existing social incentives (Perez-Truglia and Troiano 2018) or set (small) social incentives by providing information on peer behavior (Slemrod et al. 2001; Fellner et al. 2013; DelCarpio 2014).<sup>14</sup>

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<sup>10</sup>[http://sezname.gov.si/DURS/main\\_neplacniki\\_po\\_abc.html](http://sezname.gov.si/DURS/main_neplacniki_po_abc.html), accessed on June 13, 2018. Screenshots of the website are included in the Appendix. Please see Figure A.2 (in Slovenian) and Figure A.3 (translated into English).

<sup>11</sup>The theoretical literature on the origins of these concerns discusses, among others, signaling (Spence 1973) and social norms (Bénabou and Tirole 2011). In our context, both of these motives may be important. Taxpayers may avoid sending unfavorable signals on financial health towards banks and business partners and may wish to comply with a social norm.

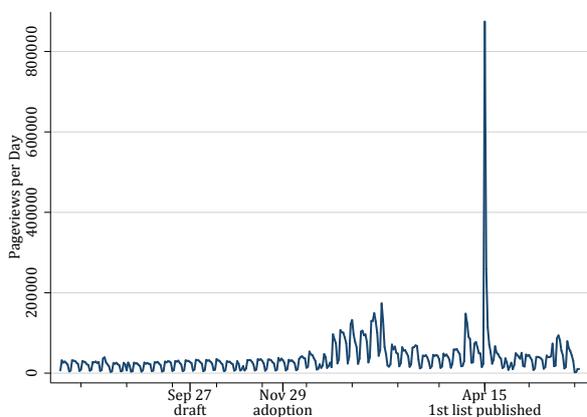
<sup>12</sup>The categories of tax debt (in € 1,000) are (5;10], (10;30], (30;50], (50;100], (100;300], (300;500], (500;1,000], (1,000;10,000], and (10,000;20,000].

<sup>13</sup>The tax administration has continued classical debt collection measures such as interest, fines, and income garnishment. They remained unchanged with the shaming policy. The daily interest on late payments in our observation period was 0.0274%, which corresponds to an annual percentage rate of 10.52%. This is twice as much as the average interest rate that banks charged from households and corporations in that time (Bank of Slovenia 2018), making tax debt an unattractive means of financing.

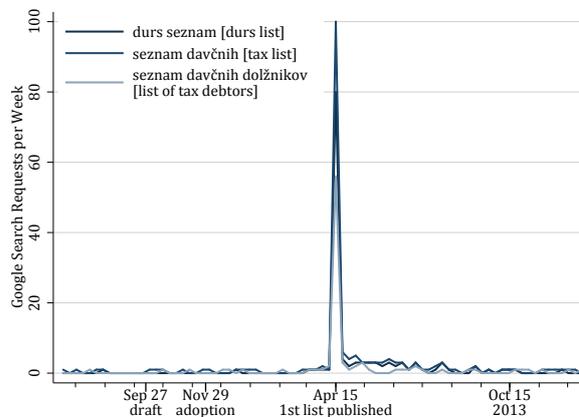
<sup>14</sup>The small incentives problem is in line with the observation that interventions could successfully change behavior only when the stakes for taxpayers were small (Luttmer and Singhal 2014).

**Figure 1: High Visibility of the Shaming Policy**

**(a) Website of the Tax Administration: Page Views**



**(b) Google Searches**



*Notes:* Figure (a) plots the number of page views of the website of the Slovenian tax administration per day. Click rates that are comparable over time are only available until June 2013 when the website was moved and restructured. Figure (b) plots the frequency of Google searches in Slovenia for different search terms related to the shaming list as listed in the legend [English translations in brackets] during our observation period. Values are reported by Google as percentages of the highest value displayed.

*Sources:* Data from the Slovenian tax administration and <https://trends.google.de>.

Second, shaming is highly visible. The shaming law was highly controversial and hotly debated in the media. The Information Commissioner of Slovenia critically followed and contributed to the public discussion. She expressed concerns that the shaming information about tax debtors would be misused or that other institutions (such as banks) would use these data for other purposes (such as loan decisions). There was broad media coverage, and many popular TV programs extensively featured the shaming law (e.g., *Odmevi*, *Studio ob 17-ih*). For all these reasons, the public was well informed about the institutional details of the shaming list. When the first shaming list was published on the website of the tax administration on April 15, 2013, click rates skyrocketed: the tax administration recorded 874,301 clicks on that day (see Figure 1a). This figure corresponded to 42% of the Slovenian population (2013: 2.06 million). Public interest was also visible in the statistics provided by Google Trends in Figure 1b. Search requests related to the shaming list spiked drastically in the week after the first shaming list was published. Afterwards, the level of search requests remained slightly elevated compared with before the publication of the first list (but receded towards the end of the year). In other words, the high public attention around the introduction of public shaming generated strong social incentives and taxpayers have been fully aware of these incentives.

Third, behavioral response shows up in the administrative data. The Slovenian tax administration shames taxpayers that have tax debt. To avoid being shamed (again), taxpayers have to pay their tax debts. In our administrative data, we observe both new tax bills and tax payments on a daily basis. That is, we can precisely measure unpaid tax debt and document any payment responses to the shaming law. All types of tax debts are treated equally, and within each tax type, the oldest tax items are cleared first. There is thus no need for taxpayers to adjust in terms of what to pay but only in how much to pay. To provide the first field

evidence on potential undesirable side effects, we study the payment response not only of tax delinquents but also of previously compliant taxpayers.

Fourth, the shaming law is applied universally to individuals and corporations. This allows us to provide the first evidence from the field on corporations and to compare the responses of individuals and corporations in magnitude. Field evidence on corporation is highly policy relevant as corporations (and not individuals) account for the bulk of unpaid taxes that tax administrations aim to enforce with public shaming. In the end, it is thus the response of corporations which makes the policy a cost-effective instrument for tax enforcement or not.

Fifth, the timing allows us to separate the threat of shaming from actual shaming. On November 29, 2012, the Slovenian parliament adopted the shaming law.<sup>15</sup> It was announced that the law would be first applied at the end of March 2013. That is, taxpayers with tax debt had about four months to pay their debt to avoid being named-and-shamed. Taxpayers that failed to do so were named-and-shamed in April 2013. The delayed implementation of the shaming law allows for behavioral responses to the threat of shaming (after the adoption but before the implementation of the law) and to actual shaming (after the first shaming list was published). The ability to distinguish between these two channels enables us to speak to what actually makes the policy work. A response to the threat of shaming implies that taxpayers have been aware of the social norm of paying taxes on time but failed to comply, and thus the shaming law increases compliance with an existing social norm. By contrast, a response to actual shaming suggests that the shaming law changes the social norm.

## 2.2. Data

Our analysis links panel data from two administrative data sources: (i) daily payment records containing tax bills issued and payments made and (ii) yearly tax registry data. The tax registry contains information on the sex and age of self-employed individuals and additional characteristics for a subset of corporations such as total capital, the number of employees, and foundation year. Tax registry data are available for 2011 to 2013. The payment records from the central tax accountancy system cover July 1, 2012 to December 31, 2013. Before 2012, payment accounts were managed locally and no comparable data are available. We were granted access, however, to the preliminary payment records for the first half of 2012. These payment records have been subject to many corrections and additions (as the central tax accountancy system was not yet full-fledged at that time).<sup>16</sup> We therefore refrain from taking absolute tax debt levels from these

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<sup>15</sup>The first unpublished draft of the law was initiated on September 27, 2012. In section 4 we show that the unpublished draft had no effect on taxpayer behavior.

<sup>16</sup>The data transfer from 16 locally managed tax offices to the central tax accountancy started on October 1, 2011. During the transition process, the number of accounts significantly reduced to one per taxpayer, which triggered several corrections and additions. According to the tax administration, it took until June 30, 2012 for all the discrepancies to be resolved and a uniform recovery system to be implemented.

**Table 1:** Descriptive Statistics

	Mean	Median	SD	SD within	# Taxpayers
<b>Panel (a): Corporations</b>					
<b>Tax debt</b>					
Old tax debt [in €]	8,133.2	0	480,149	173,589	77,578
1 <sub>l</sub> [old tax debt > 0]	23.7%				77,578
Young tax debt [in €]	2,541.8	0	135,288	106,908	77,578
1 <sub>l</sub> [young tax debt > 0]	46.1%				77,578
<b>Industry sector composition</b>					
Primary	12.2%				77,578
Secondary	16.5%				77,578
Tertiary	71.3%				77,578
<b>Tax registry information</b>					
Capital 2011	2,382,862	144,719	40,375,752		36,884
# Employees 2011	11.5	2	93.8		36,884
Years since foundation	11.0	8	10.2		77,578
<b>Panel (b): The self-employed</b>					
<b>Tax debt</b>					
Old tax debt	1,452.7	0	13,466	1,944	58,507
1 <sub>l</sub> [old tax debt > 0]	24.8%				58,507
Young tax debt	399.7	0	2,013	1,839	58,507
1 <sub>l</sub> [young tax debt > 0]	59.3%				58,507
<b>Tax registry information</b>					
1 <sub>l</sub> [gender = male]	76.4%				58,507
Age	44.4	44	10.9		58,507

*Notes:* Old tax debt refers to tax debt that is more than 90 days overdue; young tax debt refers to tax debt weakly less than 90 days overdue. The mean, median, and standard deviation (SD) of tax debt are as of November 29, 2012 (the adoption of the shaming law). We calculate the within SD of tax debt as  $\text{tax debt}_{i,t} - \overline{\text{tax debt}}_t + \overline{\text{tax debt}}_t$  with monthly data from January to November 2012 (pre-treatment months) recorded on the 25th. Industry composition and tax registry information are as of 2012. SDs and medians are unreported for the dummy variables.

preliminary data (as they are inaccurately low according to the tax administration); we merely take the earlier data to extend the time window for which we define the intensity of the treatment (see below). We limit the analysis to “active” taxpayers that incurred at least one new tax item in our observation period and exclude insolvent taxpayers as well as taxpayers with write-offs of €10 or more. The reason is that according to Slovenian regulations, taxpayers that are not subject to the shaming policy if they are not able to pay the tax “for valid or objective reasons that they could not influence themselves”. This leaves us with 58,507 self-employed individuals and 77,578 corporations.

Table 1 shows the descriptive statistics for the main variables of our data set. Panel (a) focuses on corporations and Panel (b) on the self-employed. For corporations, the variables have positively skewed distributions as one would expect in the firm data. On average, corporations have €8,133 (€2,542) of tax debt more than (weakly less than) 90 days overdue. Having tax debt is a common phenomenon: 24% of corporations have old and 46% of corporations have young tax debt. The standard deviations (SDs) of old and young tax debts reveal substantial heterogeneity across corporations. Most important for our analysis at the taxpayer level is the within-corporation variation. The within-SD measures variability in the data over

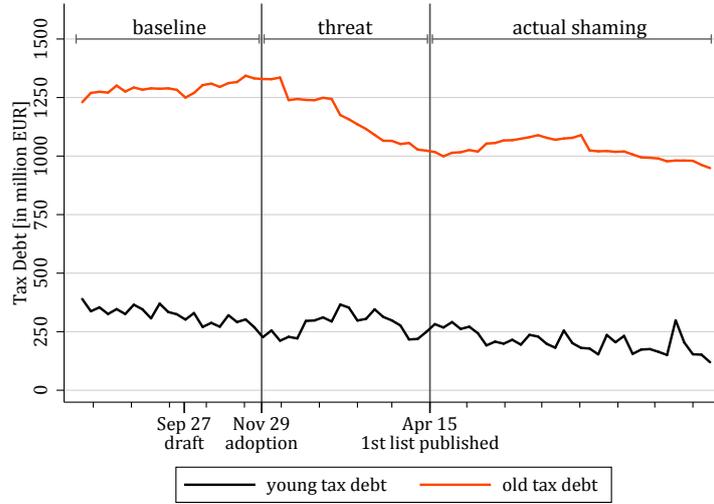
time, not across corporations. It shows substantial variation in tax debt within corporations. In total, 71% of the corporations in our data set belong to the tertiary sector, 17% belong to the secondary sector, and the remaining 12% to the primary sector. The average corporation was founded 11 years ago. Tax registry information on capital and the number of employees is available for a subsample of 36,884 corporations. On average, these corporations have capital of €2.4 million and employ 12 people.

Panel (b) presents the descriptive statistics of the self-employed. Tax debts are even more prevalent than among corporations. One-quarter of self-employed individuals have old and 59% have young tax debt. However, the tax debt amounts of the self-employed are considerably smaller. On average, €1,453 (€400) are overdue for more (weakly less) than 90 days. The average age of the self-employed is 44 years and 76% of them are men.

In Figure 2 we exploit an important feature of our data set, namely that we can accurately measure tax debt before, during, and after the introduction of the shaming law. Inspired by an event study design, the figure displays tax debt at weekly time intervals. Tax debt observed over relatively short time periods allows to gauge the impact of the shaming law as a specific event. The figure plots the tax debt of corporations from July 2012 to the end of 2013, distinguishing between tax debt more than 90 days overdue (orange line) and tax debt weakly less than 90 days overdue (black line). The bulk of total tax debt is more than 90 days overdue (“old tax debt”). Old tax debt is directly affected by the shaming law, and we expect the greatest part of the response to happen in old tax debt. Tax debt weakly less than 90 days overdue (“young tax debt”) may only indirectly be affected by the shaming law if the law improves general tax payment discipline. In the figure, we can distinguish three periods of time: (i) the time period before the adoption of the shaming law on November 29, 2012 (“baseline”), (ii) the time period after the adoption but before the publication of the first shaming list (“threat”), and (iii) the time period after the publication of the first shaming list on April 15, 2013 (“actual shaming”). After being rather stable in the baseline, old tax debt experiences a sharp drop in the period of threat. In this time window, old tax debt plummets from more than €1.3 to about €1 billion. With actual shaming, we observe some fluctuations of old tax debt, exhibiting a slight downward trend overall. These findings are consistent with the significant impact of public shaming on behavior (in the periods of both threat and actual shaming).

As these aggregate figures might be confounded by extraneous factors unrelated to the shaming law, we take a difference-in-differences approach to identify the causal effects of the threat of shaming and of actual shaming on taxpayer behavior in the following section.

**Figure 2: Aggregate Tax Debt of Corporations and the Self-Employed**



*Notes:* This figure plots aggregate tax debts of corporations and self-employed individuals. It distinguishes between “young tax debts” that are weakly less than 90 days overdue and “old tax debts” that are more than 90 days overdue (weekly data). The figure covers July 1, 2012 to December 31, 2013.

### 3. Empirical Strategy

We first consider the response to the **threat of shaming**. To do so, we exploit the fact that taxpayers were unequally likely to have old tax debt above € 5,000 before the shaming law. The probability of having old tax debt above € 5,000 in earlier times determines a taxpayer’s exposure to the shaming law: taxpayers with a high ex ante probability of tax debt above € 5,000 are more likely to be shamed (if they do not adjust their payment habits). We use individual tax debt histories before the shaming law to calculate the ex ante shaming probability as

$$\text{shaming probability}_i = \frac{1}{D} \times \sum_d \mathbb{1}[\text{old tax debt}_{i,d} > 5,000], \quad (1)$$

where  $\mathbb{1}$  is an indicator function equal to 1 if the tax debt stock more than 90 days overdue exceeds € 5,000 on day  $d$ . In essence, we calculate the old tax debt stock for each taxpayer on every day from January 1, 2012 ( $d = 1$ ) to November 28, 2012 ( $D = 333$ )—that is, from the beginning of our observation period to the day before the adoption of the law—and then count how many days a taxpayer would have been shamed on a hypothetical shaming list with the same thresholds as the adopted law. The shaming probability is then simply the share of days a taxpayer would have been shamed if the law had existed before. Figure A.4 in the Appendix shows considerable variation in the shaming probability that we can exploit for identification.

The empirical strategy is to compare changes in tax debt for taxpayers with a high shaming probability with those for taxpayers with a low shaming probability. Conceptually, our approach results in a difference-in-differences estimation with varying treatment intensities (instead of a binary treatment assign-

ment). Similar approaches have been applied in different contexts by [Rajan and Zingales \(1998\)](#), [Finkelstein \(2007\)](#), [Mian and Sufi \(2012\)](#), and [Fort \(2017\)](#).

We first consider tax debt more than 90 days overdue (which we hereafter term “tax debt”). We estimate the following ordinary least squares (OLS) regression to empirically identify the threat of shaming:

$$\begin{aligned} \% \Delta \text{tax debt}_{i,t} = & \alpha + \beta_1 \text{shaming probability}_i \times \text{Dthreat}_t \\ & + \beta_2 \text{shaming probability}_i + \beta_3 \text{Dthreat}_t + \gamma X_{i,2011} + \delta_i + \eta_t + \varepsilon_{i,t}. \end{aligned} \quad (2)$$

Our estimation sample for the threat of shaming covers July 1, 2012 to March 25, 2013 (leaving aside the period of actual shaming).  $\text{Dthreat}_t$  is a dummy variable indicating the period of the shaming threat (after the adoption of the shaming law).  $X_i$  is a vector of control variables, which includes a dummy for taxpayers with a pre-treatment shaming probability of 1 that are likely financially constrained as well as tax office, industry and legal form fixed effects and corporation age, capital, and the number of employees in 2011. In some of the regressions, we include a corporation fixed effect  $\delta_i$ . All regressions include month fixed effects  $\eta_t$  to purge seasonal patterns from the data.  $\varepsilon_{i,t}$  represents the error term. The coefficient of interest  $\beta_1$  measures the impact of the shaming threat on tax debt in percent.

For the change in tax debt, we compare a taxpayer’s level of tax debt on the 25<sup>th</sup> of month  $t$  to tax debt on the 26<sup>th</sup> of month  $t - 1$ . Changes in tax debt may be large and tax debt can be zero. Using a simple percentage change method of calculation would thus lead to many missing values. Instead, we calculate the relative change in tax debt according to the midpoint formula. That is, we express the change in tax debt between two periods in relation to the average tax debt level in both periods. To keep the relative change bounded between -1 and 1, we multiply by 0.5:

$$\% \Delta \text{tax debt}_{i,t} = 0.5 \left[ \frac{\text{tax debt}_{i,t} - \text{tax debt}_{i,t-1}}{0.5(\text{tax debt}_{i,t} + \text{tax debt}_{i,t-1})} \right]. \quad (3)$$

We also consider the effect of the shaming threat on the probability of being in tax debt and on the probability of having tax debt larger than € 5,000. Here, we estimate a linear probability model:

$$\begin{aligned} \mathbb{1}[\text{tax debt}]_{i,t} = & \alpha + \beta_1 \text{shaming probability}_i \times \text{Dthreat}_t \\ & + \beta_2 \text{shaming probability}_i + \beta_3 \text{Dthreat}_t + \gamma X_{i,2011} + \delta_i + \varepsilon_{i,t}, \end{aligned} \quad (4)$$

where  $\mathbb{1}[\text{tax debt}]_{i,t}$  is an indicator of taxpayers with strictly positive tax debt or, alternatively, taxpayers with tax debt strictly larger than € 5,000. We estimate equation (4) by linear regression ([Angrist and Pischke 2008](#)) and probe the robustness of our findings, estimating linear probability models.

Individual shaming probabilities before the introduction of the shaming law are not randomly assigned. Hence, to be able to identify a causal effect, two identifying assumptions need to hold. First, in the absence of the shaming law, any baseline differences would have continued on the same trends (“common trend assumption”). Figure A.5 in the Appendix shows that there are no structural breaks in the assessment of taxes during our study period. This also holds conditional on shaming probabilities (Figure OA.1 in the Online Appendix). Second, there should be no selection into treatment. The exact shaming thresholds were chosen irrespective of the distribution of tax debts. In addition, thresholds were switched around during the legislative procedure. For instance, the draft of the law aimed to shame all taxpayers with tax debt over €4,000 that was more than 60 days overdue. The purely accidental choice of the thresholds makes selection into treatment unlikely. To alleviate the remaining concerns, Figure A.6 in the Appendix shows that the shaming probability is uncorrelated with corporation size (measured by capital and the number of employees) and corporation age. Hence, there is no evidence for selection into treatment. In addition to specification checks within the difference-in-differences framework, we run two types of robustness analyses: an event study and a regression discontinuity design. The event study approach allows us to relax assumptions on the treatment period. In the regression discontinuity design we investigate whether payment behavior differs around the shaming threshold of €5,000 (instead of between shaming probability groups), probing the robustness of results with respect to the definition of treatment. With both event study and regression discontinuity design we run placebo tests.

Next, we focus on **actual shaming**. Here, taxpayers endogenously select into treatment, as the shaming list was publicly announced four months before its implementation and taxpayers had the possibility to avoid actual shaming by paying their tax debt early. However, taxpayers may not pay their tax debt and end up being named-and-shamed for two reasons. First, they may be unable to pay because of financial constraints. Second, the shaming incentive may not be sufficiently large to trigger a behavioral response. That is, taxpayers may assess the expected social costs of naming-and-shaming and still be unwilling to pay.

Actual shaming is unlikely to be an effective tool for reducing tax debt among financially constrained tax delinquents. On the contrary, the shaming list may signal reduced financial strength to banks and commercial partners. Hence, being part of the shaming list is likely to damage reputation, increase the cost of financing, and deteriorate terms of payment (even though the systematic use of the shaming list for these purposes by banks and commercial partners is illegal). We thus expect the liquidity constraints of financially constrained tax delinquents to become (weakly) more binding with actual shaming.

Yet, a case for actual shaming arises from tax delinquents that had false expectations. If the social costs of being named-and-shamed are larger than anticipated, actual shaming may lead some of the first unwilling tax delinquents to engage in social learning and pay their tax debt. Social costs may be larger than expected for two reasons. First, the shaming list informs of a social norm and allows for peer comparisons as it

makes the number of tax delinquents and tax debt amounts of tax delinquents public knowledge. Taxpayers can thus learn the strength of the social norm: the fewer the tax delinquents on the list (and the lower the tax debt overdue), the stronger is the social norm and the larger are the social costs of violating that social norm. Second, tax delinquents may underestimate the social costs of being named-and-shamed. In several newspapers, local taxpayers have been singled out in articles reporting on the shaming list.<sup>17</sup> Due to such media coverage of tax delinquents the social costs of being named-and-shamed may be larger than expected. To sum up, public shaming may trigger social learning (Manski 2000; Fershtman and Segal 2018) and may thus be effective at reducing tax debt.

Our estimation sample for actual shaming consists of all shamed tax delinquents. We aim to estimate the change in their tax debts driven by actual shaming and social learning. Three points are thus important for our empirical analysis. First, the information value for a taxpayer is the largest from observing the taxpayers in his or her reference group (Wenzel 2004; Gino et al. 2009), such as taxpayers in the same industry and region. This leads us to group taxpayers by industry and region when measuring social learning.<sup>18</sup> Second, while the tax debt of shamed taxpayers becomes public knowledge, the tax payment behavior of non-shamed taxpayers remains private information, even under the shaming law. This implies a clear direction of social learning: Social learning among shamed and non-shamed taxpayers occurs from shamed tax delinquents (but not from non-shamed taxpayers). Obviously, the set of information of a taxpayer and thus social learning remain unobservable. We thus proxy for social learning with the behavioral response that it triggers among non-shamed taxpayers. Importantly, our measure of social learning focuses on non-shamed taxpayers as they are not directly affected by the shaming list; any behavioral response to the shaming list among these taxpayers can be fully attributed to social learning. Third, before the first shaming list, non-shamed taxpayers perceive the social norm as (weakly) stronger than do shamed taxpayers, as revealed by their initial tax debt levels. Hence, the first shaming list leads to (weakly) more social learning among shamed tax delinquents than among non-shamed taxpayers. In other words, we measure social learning among shamed tax delinquents with error. This approach may introduce a classical errors-in-variables problem and may bias the effect of actual shaming towards zero (attenuation bias). To sum up, identifying the effects of actual shaming involves computing a measure of social learning within industry-region groups and relating these measures to tax debt.

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<sup>17</sup>For instance, an article in the regional newspaper “Dolenjski list” singled out the biggest tax debtors in the Dolenjska region (Dolenjski list 2013). Similar articles were published for other regions. Also, the media singled out certain groups by, for instance, reporting on famous Slovenians on the shaming list (Delo 2013; Slovenija 2013).

<sup>18</sup>Alstadsæter et al. (2018) study tax avoidance behavior of individuals within family networks and find that social interactions are an important determinant of behavior.

One could think of alternative mechanisms that are unrelated to social learning but could trigger tax debt payment in response to actual shaming. For instance, actual shaming (and the media reporting on it) may serve as a reminder and increase the salience of tax debt issues. Or alternatively, taxpayers may pay their taxes because they update their beliefs about how seriously the tax administration is about enforcement. While we cannot formally test and rule out these alternative mechanisms (unlike, e.g., Bursztyn et al. (2019) for credit card repayments), we argue that they are very unlikely in the present context for two reasons: First, the media already intensively covered the shaming law when the law was adopted. The wide media coverage and a heated public debate made the issue of tax debt collection and the considerable efforts of the tax administration very salient, long before the first shaming list was published. Second, our identification strategy exploits variation in the number of shamed tax delinquents across industries and regions. As long as general time effects are unrelated to the industry-region variation, they are purged from our regressions.

To empirically identify the effect of actual shaming on the tax debt of shamed tax delinquents, we estimate the following OLS regression:

$$\% \Delta \text{tax debt}_{i,r,s,p} = \kappa + \theta \text{social learning}_{\text{non-shamed},r,s,p} + \gamma \ln(\text{industry growth}_{i,2011}) + \varepsilon_{i,r,s,p}, \quad (5)$$

where the dependent variable is the relative change in tax debt among shamed tax delinquents in period  $p$ .  $\text{social learning}_{\text{non-shamed},r,s,p}$  denotes social learning among non-shamed taxpayers from the publication of the shaming list in region ( $r$ ) and industry sector ( $s$ ) until period  $p$ .<sup>19</sup> In robustness checks, we include growth rates in value added at the industry level<sup>20</sup>.  $\varepsilon_{i,r,s,p}$  is an error term. We estimate an analogous specification for the probability of reducing tax debt by strictly more than 5% and strictly more than 10%. All the extensive margin results reported are robust to estimating a logit model.

$\theta$  is the coefficient of interest that captures the impact of social learning (and actual shaming) on tax debt. Social learning is proxied for with the share of non-shamed taxpayers whose tax payment discipline improves with the publication of the shaming list:

$$\text{social learning}_{\text{non-shamed},r,s,p} = \frac{1}{N_{r,s}} \times \sum_{n=1}^{N_{r,s}} \mathbb{1} [\% \Delta \text{tax debt}_{n,r,s,\text{after}} < \% \Delta \text{tax debt}_{n,r,s,\text{before}}], \quad (6)$$

where  $\mathbb{1}$  is an indicator function equal to 1 if a taxpayer's relative reduction in tax debt after the publication of the shaming list is larger than it was before or if a taxpayer's relative increase in tax debt is smaller than before. For instance, the indicator takes 1 if a taxpayer reduces his or her tax debt by 10% before the

<sup>19</sup>To avoid censoring, we only consider non-shamed taxpayers with strictly positive tax debt levels both before shaming and on the publication date of the shaming list. In each of the 16 administrative regions, we consider 20 industry sectors.

<sup>20</sup>The information on value added growth rates by industries are published by the statistical office of Slovenia (<http://www.stat.si/statweb/en/home>).

shaming list and by more than 10% thereafter (or if tax debt increases by 10% before but by less than 10% after the publication of the shaming list). A higher share of taxpayers with improving tax payment discipline among the non-shamed in a peer group reveals a higher degree of social learning.

We consider the effects of actual shaming and social learning after the publication of the first shaming list. If taxpayers have false expectations on the social norm and the social costs of violating it, the first shaming list may bring about substantial social learning. Then, actual shaming further reduces tax debt beyond the levels reached with the threat of shaming. Social learning from later lists is expected to be close to zero, as these lists convey less additional information: The shaming list is surprisingly persistent over time: 96% of the delinquent corporations and individuals shamed on the second list featured on the first list. The corresponding figures for comparing the third and fourth shaming lists to the first list are 92% and 91%, respectively. The persistence in the composition of shamed tax delinquents also prevents us from studying the probability of leaving the shaming list as an outcome variable.

The empirical approach is to examine whether there is a break in any pre-existing differences in the trend of tax debt around the publication of the first shaming list on April 15, 2013. Our approach yields a causal effect if the common trend assumption holds. In our context, this says that the change in the tax debts of shamed tax delinquents would have been the same in industries both with little and with significant social learning. One might be concerned that macroeconomic shocks may have heterogeneously affected the tax debt of these industries through the number and amounts of new tax items. Figure [OA.2](#) in the Online Appendix shows that the average weekly amounts of due tax items smoothly evolve for industries with little and with significant social learning over our observation period, alleviating concerns of economic shocks at the region-industry level. Note that we do not know the sectors of industry of the self-employed. As we also lack information on other characteristics with which to determine the social reference group of self-employed individuals, we focus our analysis of actual shaming on corporations.

The size of the effect of actual shaming depends both on the magnitude of social learning and on the underlying distribution of tax delinquents that are unable and unwilling to pay. The underlying distribution of those types in the population is also important for the welfare consequences of the policy. Social learning can also take place among previously compliant taxpayers, who may find general payment discipline poorer than they thought. This may trigger unintended behavioral responses through contagion ([Gino et al. 2009](#)), which we discuss in Section [6](#).

#### **4. Impact of the Threat of Shaming**

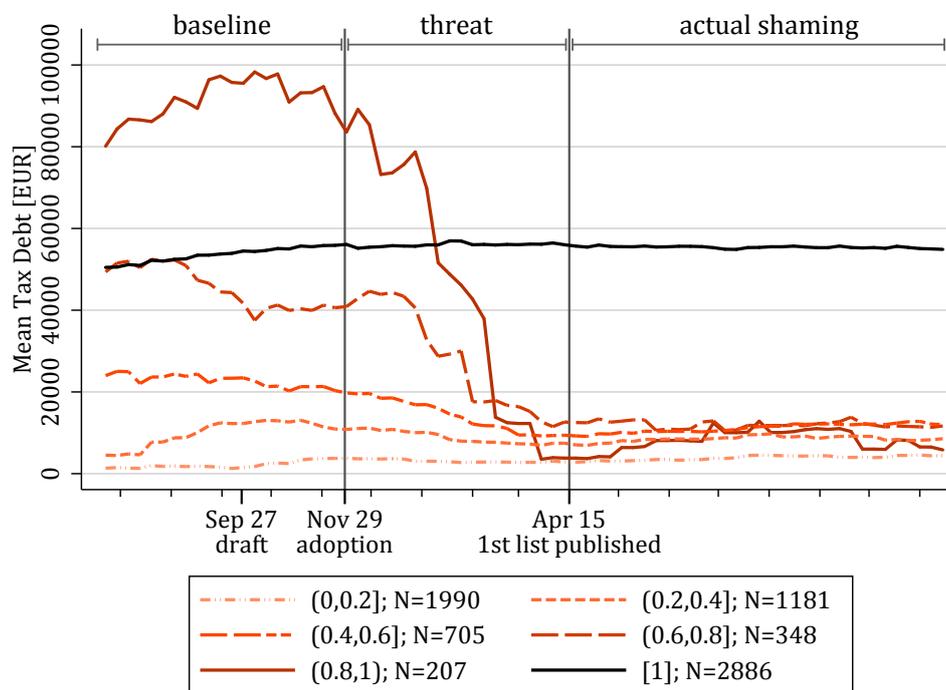
In this section, we present empirical evidence on the threat of shaming. In the following section, we focus on actual shaming.

#### 4.1. Corporations

We begin by estimating the impact of the threat of shaming on corporations. Then, we present related results for the self-employed and describe the heterogeneity in the treatment response.

**Sharp decline in average tax debt.** The shaming law introduces an incentive to pay tax debt before the law is implemented to avoid shaming, particularly for taxpayers with a high ex ante shaming probability. We expect taxpayers with a positive ex ante shaming probability to reduce their tax debt and the response to weakly increase in the shaming probability. Figure 3 presents evidence on such behavior by depicting the development of tax debt of corporations by shaming probability between July 2012 and December 2013.

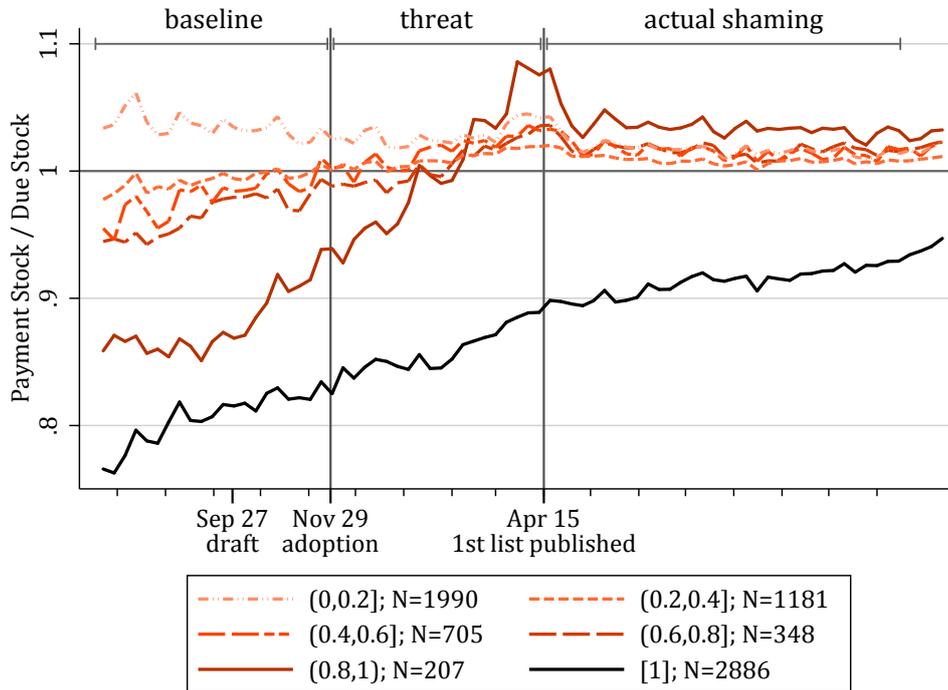
**Figure 3: Tax Debt by Shaming Probability: Corporations**



*Notes:* This figure displays the average tax debt for different groups of corporations based on their shaming probability. The figure includes all corporations with strictly positive shaming probability. Tax debt refers to tax debt more than 90 days overdue. The figure covers July 1, 2012 to December 31, 2013. To limit the effect of extreme values, we exclude from the figure taxpayers with average tax debt above the 99<sup>th</sup> percentile in each group.

Four points are of note. First, after the adoption of the shaming law, we observe a sharp decline in average tax debt. This decline continues until the first shaming list is compiled. Second, the effect is most pronounced among corporations with a shaming probability between 80% and 100% (excluding interval boundaries,  $N = 207$ ). Within four months, these corporations dramatically reduce average tax debt from above €80,000 before the adoption of the law to about €5,000 (the threshold amount) at the end of the period of threat. Third, corporations with a lower shaming probability also reduce their tax debt but to a lesser extent. Overall, the payment behavior during the period of threat substantially reduces the variation in tax debt, leading to a convergence between the shaming probability groups. Fourth, corporations

**Figure 4: Payment vs. Due Stock by Shaming Probability: Corporations**



*Notes:* The figure displays the ratio between total payments made (payment stock) and total amount due (due stock, i.e. the sum of all tax items due) on a given date. The figure covers July 1, 2012 to December 31, 2013. The stocks are calculated for each date between January 1, 2012 and December 31, 2013. For example, the payment stock (due stock) on November 29, 2012 includes all tax payments made (all tax items due) between July 1 and November 29, 2012. A ratio of 1 means that all tax items are paid on time. A ratio less than 1 means that a taxpayer accumulates tax debt. A ratio greater than 1 means that a taxpayer reduces tax debt or a previously compliant taxpayer makes tax payments before the due date. The figure includes all corporations with strictly positive shaming probability.

with a shaming probability of 100% ( $N = 2886$ ) stand out: on average, these corporations do not respond and maintain high tax debt levels of € 50,000 to € 60,000. The inertia of these corporations might point to binding financial constraints. While we do not have detailed information about the financial health of individual corporations, we do know whether a corporation is in insolvency proceedings, which can be considered an extreme form of financial constraint. Looking at the full population of Slovenian corporations, we find a strong discontinuity in the likelihood of insolvency at the shaming probability of 100%: The likelihood of insolvency for corporations with a shaming probability of 100% is 13.4%, compared to only 3.1% for those with a shaming probability of above 80% to below 100% (and 3.6% for those with a strictly positive shaming probability below 100%). Hence, a shaming probability of 100% is associated with an about 4 times larger probability of insolvency proceedings. Note that taxpayers in insolvency proceedings are excluded from our estimation sample. That is, insolvency proceedings themselves cannot explain the weak response of corporations with shaming probability of 100%. However, the discontinuity may be taken as evidence that financial constraints are particularly large for corporations with shaming probability of 100%.

**Active payment response.** To dig deeper into the impact of the threat of shaming, we take a different perspective and consider the active payment response of taxpayers. Payments made not only depend on tax

debt but also on new tax items that become due. We can thus think of the ratio between payments made and new tax items due as a measure of taxpayers' payment discipline. This ratio is 1 if taxpayers pay what becomes due, the ratio is smaller than 1 if taxpayers accumulate tax debt, and it is larger than 1 if taxpayers pay off tax debt accumulated in the past or pay their tax items before the due date. Figure 4 follows this approach and relates the stock of tax payments made to the stock of new tax items due.<sup>21</sup> The stock of tax payments made ("payment stock") is calculated at different points in time as the sum of the payments made until then since January 1, 2012. Analogously, the stock of new tax items due ("due stock") is given by the sum of all tax items that became due between January 1, 2012 and the point in time considered. A horizontal line of the payment-due-ratio reflects unchanged payment discipline, whereas a positive slope indicates improvements in payment discipline.

The graph clearly shows that payment discipline improves with the adoption of the shaming law. The ratio of payments made to tax items due shows a clear upward trend, particularly after the adoption of the shaming law. That is, corporations increase their payments to the tax administration in relation to the amount of tax items due. This effect is most pronounced in the groups of taxpayers with a high shaming probability. The payment-due-ratio rises above 1 (except for the group of taxpayers with a shaming probability of 100%) until the shaming law is implemented. That is, the average taxpayer pays more than what becomes due. Payment discipline reaches a new equilibrium in which the payment-due-ratio is slightly above 1 (taxpayers with shaming probability below 100%). Taxpayers with a low shaming probability exhibit a payment-due-ratio above 1 from the start, which means that they clear their outstanding tax items before the due date. We again find that the shaming law reduces the variation across groups of taxpayers and leads to converging payment-due-ratios. This result is in line with our findings on tax debt (Figure 3) even though the two figures are not directly comparable, as Figure 4 offers no interpretation in terms of debt levels.<sup>22</sup> This also manifests in the declining age of tax debt items. Figure OA.4 in the Online Appendix displays the development over time of the age of cleared tax items. Taken together, the results on tax debt, the payment-due-ratio and the age of cleared tax items suggest that the threat of shaming significantly reduces tax debt and improves overall tax payment discipline.

**Regression results.** Next, we quantify the impact of the threat of shaming in linear regressions. We estimate equation (2) by using OLS, with the relative change in tax debt as the dependent variable. From Figure 3, we know that the group of taxpayers with a shaming probability of 100% stand out in their response

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<sup>21</sup>An alternative would be to calculate the ratio of payments made and new items due based on flow variables. This measure turns out to be noisy. For instance, slightly late payments lead to a small payment due ratio when the items are due and a large ratio when the payment is actually made. In addition, when using flow variables, the bin size becomes important. For all these reasons, we prefer to calculate the payment-due-ratio based on stock variables.

<sup>22</sup>The reason is that tax debt levels also depend on the amount of new tax items that fall due. An increase in the payment-due-ratio can thus be consistent with both falling and increasing tax debt depending on the amount of new tax debt.

**Table 2:** Effect of the Shaming Threat on Tax Debt: Corporations

Dependent variable: $\% \Delta \text{tax debt}_{i,t}$	OLS			FE
	(1)	(2)	(3)	(4)
Shaming Probability $\times$ Dthreat(0/1)	-0.075*** (0.011)	-0.075*** (0.011)	-0.057*** (0.013)	-0.075*** (0.011)
Dthreat(0/1)	-0.020*** (0.001)	-0.020*** (0.001)	-0.018*** (0.002)	-0.017*** (0.001)
Shaming Probability	-0.023*** (0.007)	-0.026*** (0.007)	-0.027*** (0.008)	
D100(0/1) $\times$ Dthreat(0/1)	0.085*** (0.011)	0.085*** (0.011)	0.058*** (0.013)	0.085*** (0.011)
D100(0/1)	0.023*** (0.007)	0.023*** (0.007)	0.035*** (0.008)	
Corporation Age			✓	
Capital in 2011			✓	
# Employees in 2011			✓	
Tax Office FE		✓	✓	
Industry FE		✓	✓	
Legal form FE		✓	✓	
Corporation FE				✓
Month FE	✓	✓	✓	✓
Observations	698,202	698,202	331,956	698,202
# Corporations	77,578	77,578	36,884	77,578

*Notes:* Standard errors clustered at the taxpayer level are in parentheses. Tax debt refers to tax debt more than 90 days overdue. \*\*\* denotes significance at the 1% level.

*Sample:* All corporations.

to the shaming threat (as they may be financially constrained). To take this into account, we separately estimate the effects for this group. To do so, we include a dummy variable D100, indicating these taxpayers, and interact the dummy variable with the dummy of the period of the shaming threat.<sup>23</sup> Table 2 presents our core results on how tax debt is causally affected by the shaming threat. We find that introducing a shaming threat significantly reduces tax debt. Column (1) includes month fixed effects only. Our preferred specification in column (2) additionally includes tax office, industry, and legal form fixed effects to purge any systematic differences from the regression. The interaction term of the Shaming Probability  $\times$  Dthreat yields a coefficient of interest equal to -0.075 (column (2)). Evaluating the coefficient of -0.075 at the sample average (i.e., a shaming probability of 29.3%)<sup>24</sup> shows that the threat of shaming reduces tax debt by 2.2% per month. This effect is economically and statistically significant.

In further specifications, we probe the robustness of our result. Column (3) includes corporation age, capital, and the number of employees in 2011 as further control variables. Information on the control variables is available for about half of the sample only. Although the estimate of the causal effect of the

<sup>23</sup>To calculate the effect of the shaming threat on those taxpayers, we have to combine the interaction term between the shaming probability and Dthreat (multiplied by 1) with the interaction term between D100 and Dthreat. This reveals the lack of response among taxpayers with a shaming probability of 100%, consistent with Figure 3.

<sup>24</sup>The sample average is calculated among taxpayers with a strictly positive shaming probability below 100%.

shaming threat is somewhat smaller in the restricted sample (-0.057 vs. -0.075 with a  $p$ -value of 0.01), we still find that the shaming threat is effective at reducing tax debt. Since the restricted sample oversamples large corporations, we return to our preferred specification and additionally include taxpayer individual fixed effects (column (4)). Compared to column (2) our results are virtually unchanged, which shows the substantial amount of “within”-corporation variation in the data that we exploit for identification.

Interestingly, tax debt falls significantly for all taxpayers with the shaming threat (statistically significant coefficient of -0.02 for  $D_{threat}$ ). This decline is consistent with the tax administration successfully sending a general signal about the non-acceptability of tax debt (see literature on expressive function of the law, e.g., [Sunstein 1996](#); [Bénabou and Tirole 2011](#)). However, the effect of such a signal cannot be causally identified here, which leads us to underestimate the total effect of the shaming policy. We note that the reduction implied by  $D_{threat}$  may also be driven by other macroeconomic factors.

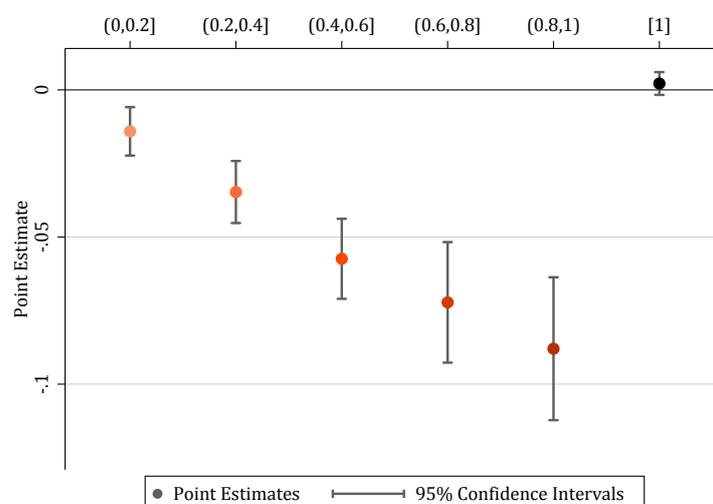
**Total effect of shaming threat.** The threat of shaming was in place for four months (from November 29, 2012 to March 25, 2013). We calculate the total impact of the threat of shaming over these four months as  $(1 + \hat{\beta}_1 \times \text{Shaming Probability})^4 - 1$ , using the average shaming probability of 29.3% among corporations with a strictly positive shaming probability below one. On average, the threat of shaming reduces their tax debt by 8.5%. When the shaming threat became effective on November 29, 2012, Slovenian corporations overall had accumulated €1.22 billion in tax debt older than 90 days. Thereof, €274 million belong to corporations with a strictly positive shaming probability below one. Owing to the threat of shaming, the tax administration could collect additional tax revenue of €23 million alone from these corporations over the course of these four months.<sup>25</sup> Remember that Slovenia introduced the shaming policy to enforce tax debt which turned out to be uncollectable with the enforcement measures in place (see Section 2). In Figure 3 and Figure 4 we have seen that the shaming law was effective in achieving this goal: After the adoption of the shaming law, there is a marked reduction in tax debt levels and an increase of payment-due-ratios to above one. After the publication of the first shaming list, the tax debt levels and the payment-due-ratios stabilize again. This suggests that taxpayers reach a new equilibrium. Together with the previous point, this implies that the tax revenue collected with the shaming policy is indeed additional tax revenue (and not just payments brought forward). We note that our estimates are a lower bound of the long-term effects of the shaming policy as the new equilibrium affects all future tax payments. Quantifying these long-term effects on tax revenue, however, is difficult as it requires assumptions about all future taxes assessed (which are collectable under the new equilibrium but would have been uncollectable before).

**Robustness.** We have thus far assumed that the effect of the shaming threat linearly increases in the shaming probability. To more flexibly estimate the impact of the shaming threat for different shaming

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<sup>25</sup>This corresponds to 4% of the annual corporate income tax revenue.

**Figure 5:** Effect of the Shaming Threat on Tax Debt by the Shaming Probability: Corporations



*Notes:* The figure displays the monthly relative change in tax debt for different ranges of the shaming probability. Tax debt refers to tax debt more than 90 days overdue. The coefficients are estimated as in column (2) in Table 2, but we interact the period of threat dummy with dummy variables for the six shaming probability groups (instead of a continuous shaming probability). The effect of the baseline shaming probability on the change in tax debt is assumed to be constant across the shaming probability groups. Taxpayers with a shaming probability of 0% are the baseline group. The whiskers indicate the 95% confidence intervals (with cluster robust standard errors at the taxpayer level).

probabilities, we replace the continuous shaming probability with six dummy variables. These dummy variables correspond to shaming probability ranges of  $(0, 0.2]$ ,  $(0.2, 0.4]$ , ...,  $(0.8, 1]$ , and  $[1]$  (as in Figure 3). Figure 5 shows the monthly relative reduction in tax debt for the shaming probability groups. The effect of the shaming threat increases linearly in the shaming probability. In other words, if a taxpayer is twice as likely to be affected by the shaming policy, he or she reduces her tax debt twice as much.<sup>26</sup> The exception from this pattern is the group with a shaming probability of 100%, which has an estimated effect close to zero. We return to this observation in Section 5. These findings confirm that estimating a linear relationship between the shaming probability and tax debt is unrestrictive.

We further explore the robustness of our results in Table 3, where we define the treatment status based on the average *amount* of old tax debt two weeks prior to the adoption of the shaming law (instead of based on the pre-treatment shaming probability). In these regressions, we consider corporations with pre-treatment old tax debt of  $(\text{€ } 5000; \text{€ } 7500]$  as treated, and those with pre-treatment old tax debt of  $(\text{€ } 2500; \text{€ } 5000]$  as untreated (columns 1 and 2). In further regressions we vary these thresholds to  $(\text{€ } 5000; \text{€ } 6000]$  and  $(\text{€ } 4000; \text{€ } 5000]$  (columns 3 and 4) as well as to  $(\text{€ } 5500; \text{€ } 5000]$  and  $(\text{€ } 4500; \text{€ } 5000]$  (columns 5 and 6) for the treatment and control groups, respectively. We obtain very similar estimates both without and

<sup>26</sup>Also in the simpler difference-in-differences analysis, in which we estimate the effect of the shaming threat on tax debt by comparing tax debt at two moments in time (instead of considering all the monthly changes in between), we cannot reject the null hypothesis of a linear time trend. Figure OA.3b in the Online Appendix provides a break-down of the full effect of the shaming threat by shaming probability.

**Table 3:** Effect of the Shaming Threat on Tax Debt: Treatment Status Assigned Based on Amounts

Dependent variable: $\% \Delta \text{tax debt}_{i,t}$	Bandwidth around the shaming threshold of					
	€2500		€1000		€500	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment $\times$ Dthreat(0/1)	-0.069*** (0.012)	-0.044*** (0.015)	-0.081*** (0.019)	-0.069*** (0.024)	-0.069*** (0.026)	-0.057* (0.034)
Dthreat(0/1)	-0.116*** (0.009)	-0.192*** (0.013)	-0.116*** (0.016)	-0.175*** (0.022)	-0.090*** (0.023)	-0.152*** (0.038)
Treatment	0.043*** (0.008)	0.030*** (0.010)	0.048*** (0.012)	0.036** (0.015)	0.047*** (0.016)	0.051** (0.021)
D100(0/1) $\times$ Dthreat(0/1)	0.215*** (0.011)	0.225*** (0.014)	0.215*** (0.017)	0.236*** (0.020)	0.197*** (0.023)	0.224*** (0.028)
D100(0/1)	-0.136*** (0.007)	-0.139*** (0.009)	-0.133*** (0.010)	-0.147*** (0.015)	-0.118*** (0.014)	-0.159*** (0.024)
Corporation Age		✓		✓		✓
Capital in 2011		✓		✓		✓
# Employees in 2011		✓		✓		✓
Tax Office FE	✓	✓	✓	✓	✓	✓
Industry FE	✓	✓	✓	✓	✓	✓
Legal form FE	✓	✓	✓	✓	✓	✓
Month FE	✓	✓	✓	✓	✓	✓
Observations	18,819	10,665	6,948	3,978	3,366	1,890
# Corporations	2,091	1,185	772	442	374	210

*Notes:* Standard errors clustered at the taxpayer level are in parentheses. Tax debt refers to tax debt more than 90 days overdue (old tax debt). Treatment status is defined based on the average amount of old tax debt two weeks prior to the adoption of the shaming law. In columns (1) and (2) corporations with pre-treatment old tax debt of (€5000;€7500] are treated and those with pre-treatment old tax debt of (€2500;€5000] are untreated. In columns (3) and (4) corporations with pre-treatment old tax debt of (€5000;€6000] are treated and those with pre-treatment old tax debt of (€4000;€5000] are untreated. In columns (5) and (6) corporations with pre-treatment old tax debt of (€5000;€5500] are treated and those with pre-treatment old tax debt of (€4500;€5000] are untreated. \*\*\* denotes significance at the 1% level.

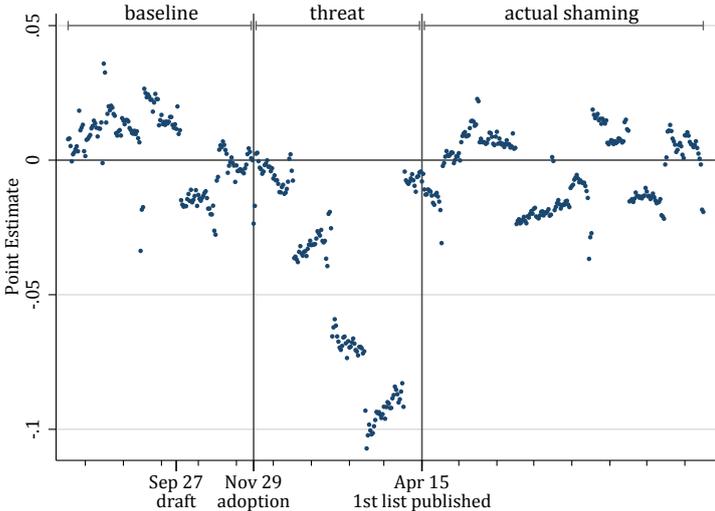
with additional controls.<sup>27</sup> Throughout, these regressions document larger reductions of tax debt among treated corporations compared to the control group during the threat-of-shaming period. It is reassuring that our results on the threat of shaming are robust to whether we define the treatment status based on tax debt amounts or based on the shaming probability, to which we return in the following.

**Event study approach.** Hitherto, we have interacted the shaming probability with a predefined period of threat dummy. That is, we have predefined the period of the shaming threat to estimate the impact of the shaming law. Next, we relax the assumption of a predefined time period. Inspired by an event study design we instead estimate interaction effects between the shaming probability and each single day in our estimation sample. This allows us to gauge whether the shaming probability is a valid measure of the intensity of treatment through the shaming law. While we expect the interaction effects to be insignificant prior to the adoption of the shaming law (placebo test), we expect them to significantly explain reductions in tax debt once the shaming law is adopted. To purge general time trends and unobserved heterogeneity

<sup>27</sup>Note that the regressions separately estimate the treatment effect for the group of taxpayers with a shaming probability of 100% (which points to binding financial constraints). Again we find that this group of taxpayers does not respond to the threat of shaming, consistent with our findings from our main regressions.

we include month of the year and corporation fixed effects. Figure 6 depicts the interaction effect for each day in our sample period (each normalized with the estimate for the last day of the baseline period). Three things are of note. First, the interaction effects are fluctuating closely around zero in the baseline period. That is, the shaming probability cannot explain changes in tax debt prior to the adoption of the shaming law. This suggests that corporations with different shaming probabilities indeed follow a common trend prior to the shaming law. The same applies to the period of actual shaming when the shaming threat was no longer pertinent. Second, the point estimates are very close to zero after the draft and before the adoption of the law. This is exactly what we expect as the draft remained unpublished. As the draft was unknown to taxpayers, taxpayers could also not respond to it. Third, point estimates indicate a sharp drop in tax debt shortly after the adoption of the shaming law. The threat of shaming, as measured by the ex ante shaming probability, thus indeed caused a large drop in tax debt.

**Figure 6:** Impact of the Shaming Threat Without Predefined Treatment Period: Corporations

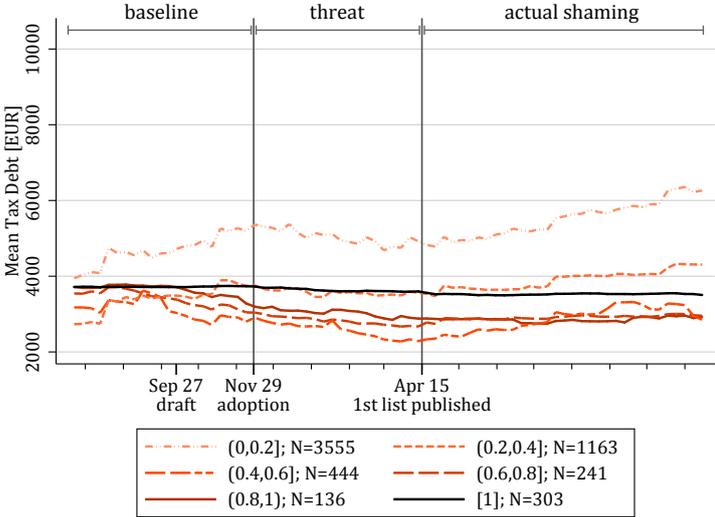


*Notes:* This figure plots the  $\beta$ 's of the regression  $\% \Delta \text{tax debt}_{i,d} = \alpha + \beta \text{shaming probability}_i \times D \text{day}_d + \gamma_m + \delta_i + \varepsilon_{i,d}$ , where  $\% \Delta \text{tax debt}_{i,d}$  is the relative change in tax debt during the 30-day time period up to day  $d$ .  $D \text{day}_d$  is a vector of dummy variables, with each dummy indicating an individual day in our sample period.  $\gamma_m$  and  $\delta_i$  represent month of the year and corporation fixed effects, respectively. All estimates are displayed relative to that for Nov 28, 2012, the last day of the baseline period.

**Placebo test.** Next, we run a placebo test among corporations with pre-treatment tax debt always weakly smaller than €5,000 (placebo sample). All of these corporations remained unaffected by the introduction of the shaming law. We test the effects of a placebo shaming law with shaming threshold of €2,500. In parallel to our calculations of the pre-treatment shaming probability, we calculate a placebo shaming probability. For each taxpayer in our placebo sample, this placebo shaming probability equals the share of pre-treatment days with tax debt above €2,500. We then plot the development of tax debt by placebo shaming probability groups. Figure 7 shows that the hypothetical announcement of the placebo shaming law has no impact in any of the groups. This is exactly what we would expect given that all corporations in the

placebo sample remained unaffected by the true shaming law (and also what we find in placebo regressions; results available upon request). The figure further provides evidence that corporations with low and high tax debt levels indeed followed the same time trend absent the treatment.

**Figure 7: Placebo Test: Corporations**



*Notes:* This figure displays the average tax debt for corporations with pre-treatment tax debt always weakly smaller than €5,000 (placebo sample). All of these corporations remained unaffected by the introduction of the shaming law. Corporations are grouped based on their placebo shaming probability, which equals the share of pre-treatment days with tax debt above €2,500. Tax debt refers to tax debt more than 90 days overdue. The figure covers July 1, 2012 to December 31, 2013. To limit the effect of extreme values, we exclude from the figure taxpayers with average tax debt above the 99<sup>th</sup> percentile in each group.

**Regression discontinuity approach.** Despite the evidence presented above, a crucial concern is that taxpayers with small and large tax debts would have followed different time trends absent the treatment. We address this concern by complementing our difference-in-differences and event study approaches by a regression discontinuity design (RDD). In this RDD we investigate whether the tax payment behavior of (affected) corporations just to the right of the shaming threshold differs from that of (unaffected) corporations just to the left of the threshold. The underlying identifying assumption is that all other factors (other than the threat of shaming) are evolving smoothly around the threshold. Figures A.7 and A.8 in the appendix provide supportive empirical evidence for this assumption to hold.

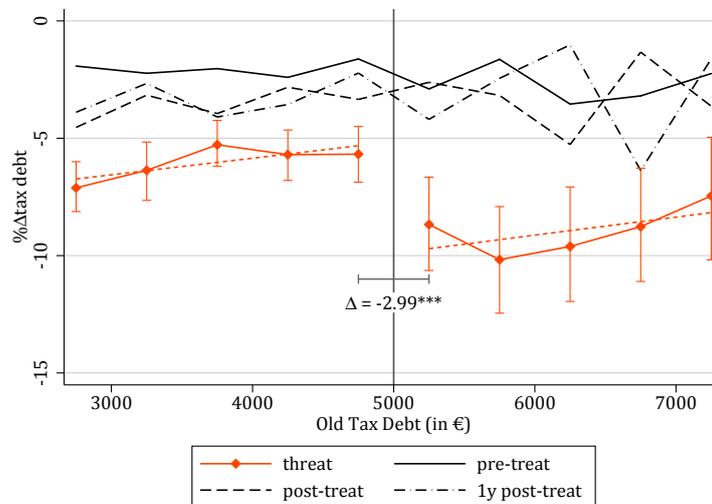
The orange diamonds and lines in Figure 8 show the results for the treatment period. Compared to corporations that are unaffected by the shaming threat, affected corporations display a much stronger reduction in their tax debt. The difference between the two sides of the threshold implies that the threat of shaming causes a reduction in tax debt by an additional 3 percentage points per month. This effect is both statistically and economically significant. The excess reduction among affected corporations is 53 percent of the average tax debt reduction of unaffected corporations below the threshold. It is reassuring to note that the RDD estimate (-3% per month) is similar in magnitude as the effect estimated in our difference-in-differences and

event study approaches (-2.2% per month). We note that unaffected corporations to the left of the threshold also reduce their tax debt, which is consistent with an expressive function of the shaming law.

The black lines in Figure 8 depict the results from several placebo tests. The “pre-treat” placebo estimation (black solid line) assumes the threat of shaming to start four months before the adoption of the shaming law. In the “post-treat” placebo test (black dashed line) the threat of shaming is assumed to start just after the true period of threat ended, and in the “1y post-treat” (black dash-dotted line) the threat of shaming is assumed to start (about) a year after the true period of threat (on August 28<sup>th</sup>, 2013, the latest date possible with our data set). None of the placebo estimations show any effect around the threshold, which is exactly what we would expect outside the actual period of threat.

Taken together, the results of the RDD approach imply a strong effect of the threat of shaming on tax payment behavior. The effect is slightly larger than what we find in our difference-in-differences and event study estimations. While the RDD design offers high internal validity as it can be analyzed like a randomized experiment, we note that it comes at the cost of limited external validity as the effect is only identified for a small sub-population. In what follows we therefore return to our difference-in-differences approach.

**Figure 8: Regression Discontinuity Analysis: Corporations**



*Notes:* This figure shows the reduction of tax debt in % for corporations with old tax debt slightly below or above the shaming threshold of €5,000 on November 29, 2012 (the day of adoption of the shaming law). The effect of the shaming threat is depicted in orange, results from placebo estimations are depicted in black. For each tax debt bin the orange diamonds show the average of the monthly relative reduction (in %) during the 4-months period of threat. Whiskers indicate bootstrapped 95% confidence intervals (400 replications). The dashed orange lines represent linear predictions, estimated separately from local linear regressions to the left and to the right of the cutoff. The black lines refer to three placebo estimations. The placebo estimations differ in the starting date of the 4-months placebo period. (i) “pre-treat” (solid line) starts four months before the adoption of the shaming law (on July 28<sup>th</sup>, 2012); (ii) “post-treat” (dashed line) starts four months after the threat (on March 28<sup>th</sup>, 2013); (iii) “1y post-treat” (dash-dotted line) starts (about) a year after the threat (on August 28<sup>th</sup>, 2013, the latest date possible with our data set). Old tax debt levels on these dates are also used to classify corporations into bins. The bin size is €500. The figure excludes corporations with shaming probability of 1.

**Alternative outcomes.** Table 4 digs deeper by considering alternative outcome variables. We present the results on the probability of having tax debt larger than €5,000 and on the probability of being in tax

debt (equation (4)). For each of these outcomes, we show the responses in our preferred specification (from Table 2, column 2) and in the specification including fixed effects. The table reveals the additional insight that the threat of shaming is effective for large parts of the taxpayer population (and cannot be explained by some taxpayers sharply cutting back their tax debts). In what follows, we evaluate all the effects at the average shaming probability of 29.3% among corporations with strictly positive shaming probability below one.

The shaming threat reduces the probability of having tax debt larger than €5,000 by 12.6 percentage points<sup>28</sup> (columns (1) and (2)) and the probability of having tax debt by 10 percentage points or -43%<sup>29</sup> (columns (3) and (4)). All these findings are robust to estimating non-linear probability models.

Bunching analyses revealed no excess mass just below the shaming threshold of €5,000 (results available upon request). Our finding that the shaming threat also reduces the probability of tax debt (and not only the probability of tax debt above €5,000) suggests that the shaming law has also been an effective tool for enforcing smaller tax debt amounts (which may rise above the threshold over time). Remind yourself that the Slovenian tax administration charges daily interest on late payments, which is above market interest. This spread of interest makes it rational for taxpayers that—with the shaming law—intend to pay their tax debt at some point to do so immediately. The observation that corporations quickly reduce their tax debt after the adoption of the shaming law is in line with these considerations. Taken together, the observed behavior in response to the threat of shaming suggests a shift in the share of taxpayers committed to pay their tax debt.

Taken together, the threat of shaming reduces tax debt, when we consider both total responses (as measured by the relative change in tax debt) and extensive margin responses (as measured by the probability of exhibiting various tax debt levels).

#### 4.2. *The Self-Employed*

Next, we show how the shaming threat causally affects the tax debt of the self-employed. Table 5 presents the results from our baseline specification and from a specification with individual fixed effects for all outcomes. While we lack the statistical power to find a statistically significant effect on the relative change in tax debt (columns (1) and (2)) in our panel estimations, we do find economically and statistically significant effects in a simpler difference-in-differences analysis. In these simpler difference-in-differences analyses, we estimate the effect of the shaming threat on tax debt by comparing tax debt at two moments in time (instead of considering all the monthly changes in between). Specifically, we compare individual

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<sup>28</sup>Altogether, 5.8% of the corporations with strictly positive shaming probability below one have tax debt larger than €5,000 and more than 90 days overdue. The relative effect is thus  $(-0.431 \times 0.293)/0.058 = -218\%$ .

<sup>29</sup>23.7% of the affected corporations have tax debt more than 90 days overdue (see Table 1). The relative effect is thus -43%:  $(-0.347 \times 0.293)/0.237$ .

**Table 4:** Effect of the Shaming Threat on Prevalence of Tax Debt: Corporations

Dependent variable:	$\mathbb{1} [\text{tax debt}_{i,t} > 5,000]$		$\mathbb{1} [\text{tax debt}_{i,t} > 0]$	
	OLS (1)	FE (2)	OLS (3)	FE (4)
Shaming Probability $\times$ Dthreat(0/1)	-0.431*** (0.015)	-0.431*** (0.015)	-0.347*** (0.015)	-0.347*** (0.015)
Dthreat(0/1)	0.006*** (0.000)	0.005*** (0.000)	-0.068*** (0.001)	-0.065*** (0.001)
Shaming Probability	1.040*** (0.013)		1.042*** (0.014)	
D100(0/1) $\times$ Dthreat(0/1)	0.406*** (0.015)	0.406*** (0.015)	0.382*** (0.014)	0.382*** (0.014)
D100(0/1)	-0.043*** (0.013)		-0.254*** (0.013)	
Tax Office FE	✓		✓	
Industry FE	✓		✓	
Legal form FE	✓		✓	
Corporation FE		✓		✓
Month FE	✓	✓	✓	✓
Observations	698,202	698,202	698,202	698,202
# Corporations	77,578	77,578	77,578	77,578

*Notes:* Standard errors clustered at the taxpayer level are in parentheses. Tax debt refers to tax debt more than 90 days overdue. \*\*\* denotes significance at the 1% level.

*Sample:* All corporations.

tax debt levels at the end of the threat period (March 2013) with tax debt levels in each of the four months before (starting with November 2012 as the last month before the adoption of the shaming law). These comparisons allow us to determine the overall effect of the shaming threat on tax debt as well as the dynamics in the payment behavior of the self-employed. Figure 9 illustrates that focusing on changes over longer periods is particularly meaningful for the self-employed whose tax amounts fluctuate substantially.<sup>30</sup> The first dot (printed in bright orange) shows the coefficient for the full period of threat (from November 2012 to March 2013). The coefficient of -0.162 implies that the threat significantly reduces tax debt by 5% for the average self-employed individual (average shaming probability of 30.7% for individuals with strictly positive shaming probability below one), which is equal to extra tax revenue of €0.5 million. The other dots (printed in lighter orange) show the corresponding coefficients by subperiod. For instance, the second coefficient disregards the first month of threat and compares tax debt levels between March 2013 and December 2012. Comparing that coefficient of -0.083 with the coefficient for the full period of threat yields a statistically significant difference of -0.08. That is, the average self-employed individual reduces his or her tax debt by 2.5% ( $-0.08 \times 30.7\%$ ) within the first month of threat. This corresponds to 50% of the overall reduction.

<sup>30</sup>These fluctuations are driven by both unsteady income and irregular tax self-assessment. For instance, many self-employed individuals have to self-assess their value added tax on a quarterly basis only. The yearly assessment of personal income tax takes place between the end of March and the end of May, which may lead to another temporary effect on tax debt for the self-employed.

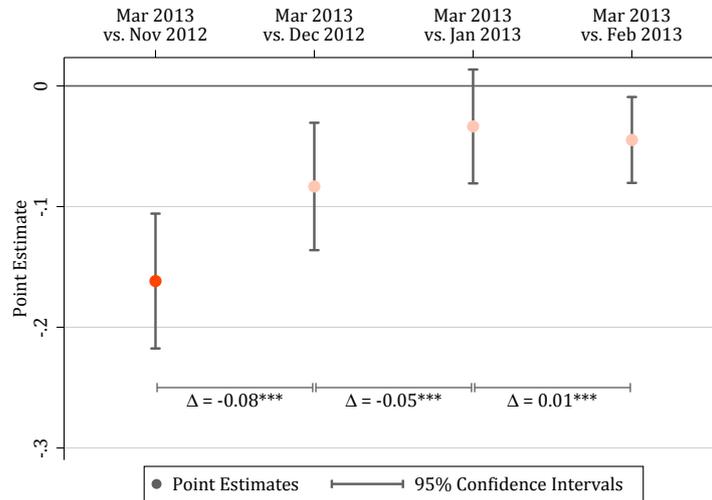
**Table 5:** Effect of the Shaming Threat on Tax Debt: The Self-Employed

Dependent variable:	$\% \Delta \text{tax debt}_{i,t}$		$\mathbb{1} [\text{tax debt}_{i,t} > 5,000]$		$\mathbb{1} [\text{tax debt}_{i,t} > 0]$	
	OLS (1)	FE (2)	OLS (3)	FE (4)	OLS (5)	FE (6)
Shaming Probability × Dthreat(0/1)	0.013 (0.013)	0.013 (0.013)	-0.314*** (0.021)	-0.314*** (0.021)	-0.220*** (0.018)	-0.220*** (0.018)
Dthreat(0/1)	-0.013*** (0.001)		0.005*** (0.000)		-0.032*** (0.002)	
Shaming Probability	-0.052*** (0.008)		1.042*** (0.019)		1.247*** (0.020)	
D100(0/1) × Dthreat(0/1)	0.001 (0.013)	0.001 (0.013)	0.291*** (0.021)	0.291*** (0.021)	0.227*** (0.018)	0.227*** (0.018)
D100(0/1)	0.048*** (0.008)		-0.044** (0.019)		-0.429*** (0.020)	
Tax Office FE	✓		✓		✓	
Taxpayer FE		✓		✓		✓
Month FE	✓	✓	✓	✓	✓	✓
Observations	526,563	526,563	526,563	526,563	526,563	526,563
# Selfemployed	58,507	58,507	58,507	58,507	58,507	58,507

Notes: Standard errors clustered at the taxpayer level are in parentheses. Tax debt refers to tax debt more than 90 days overdue. \*\*\* denotes significance at the 1% level and \*\* at the 5% level.

Sample: All self-employed individuals.

**Figure 9:** Effect of the Shaming Threat on Tax Debt: The Self-Employed



Notes: The figure displays the estimated effect of the shaming threat on tax debt, focusing on various time comparisons. Tax debt refers to tax debt older than 90 days. The coefficients are estimated as in column (1) in Table 5, but with the overall change in tax debt between the two indicated dates (instead of considering all the monthly changes in between). The first dot (printed in bright orange) shows the coefficient for the full period of threat. The subsequent dots (printed in lighter orange) show the corresponding coefficients by subperiod. The whiskers indicate the 95% confidence intervals (with robust standard errors). Each of the  $\Delta$  coefficients refers to a single month of the shaming threat. For instance,  $\Delta = -0.08^{***}$  is the estimated coefficient for the first month of the shaming threat, which is statistically different from zero at the 1% level.

Finally, we use other outcome variables to probe further the impact of the threat of shaming on the tax debt of the self-employed. Table 5 shows that the threat of shaming significantly reduces the probability of having tax debt larger than €5,000 by 39% (columns (3) and (4)).<sup>31</sup> Again, we find that the shaming threat extends to smaller tax debt amounts. The overall probability of tax debt is reduced by 6.75 percentage points among the self-employed (columns (5) and (6)).<sup>32</sup>

The impact on the self-employed is somewhat smaller than that on corporations.<sup>33</sup> This finding is in line with our expectations for three reasons. First, the tax debt levels of the self-employed are considerably below those of corporations. Because of the threshold amount of the shaming law of €5,000, the self-employed have to change their behavior by less in order to avoid shaming. Second, the self-employed are more likely to be financially constrained as information constraints on potential lenders may be more severe for unincorporated firms (see, e.g., [Liu and Devereux 2016](#)). Third, being named-and-shamed may be particularly detrimental to business affairs of corporations. As with child labor and other issues of societal attention, many corporations include principles on tax affairs in their codes of conduct. Often, they impose sanctions on their business partners in case of non-compliance with the provisions included in the codes. Shamed tax delinquents may thus have to face significant consequences such as the cancellation of orders or the termination of business relationships. While our findings for the self-employed are somewhat smaller, they confirm our results for corporations: the shaming threat significantly reduces tax debt.

#### 4.3. Heterogeneity

We expect the policy to affect taxpayers differently depending on the social costs incurred. First, we expect corporations with high reputational concerns to more strongly respond to the policy. Reputational concerns should be particularly large for corporations that mainly sell to end customers such as corporations in the tertiary sector. For instance, [Hanlon and Slemrod \(2009\)](#) document that in particular the stock prices of companies in the retail sector decline after news about the companies' tax sheltering activities become public, suggesting that the reaction may partially be related to a consumer backlash. By contrast, we expect corporations to be less concerned about their reputation if they are mainly suppliers to other corporations such as corporations in the primary and secondary sectors. Second, corporations in non-exporting industries, which only serve the domestic market in Slovenia, are particularly dependent on having a good

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<sup>31</sup>24.8% of the self-employed individuals in our sample have tax debt more than 90 days overdue (see Table 1). The relative effect is thus  $(-0.314 \times 0.307)/0.248 = -38.9\%$ .

<sup>32</sup>5.2% of the self-employed with strictly positive shaming probability below one have tax debt above €5,000 that is more than 90 days overdue. Hence, the relative effect is  $(-0.220 \times 0.307)/0.052 = -130\%$ .

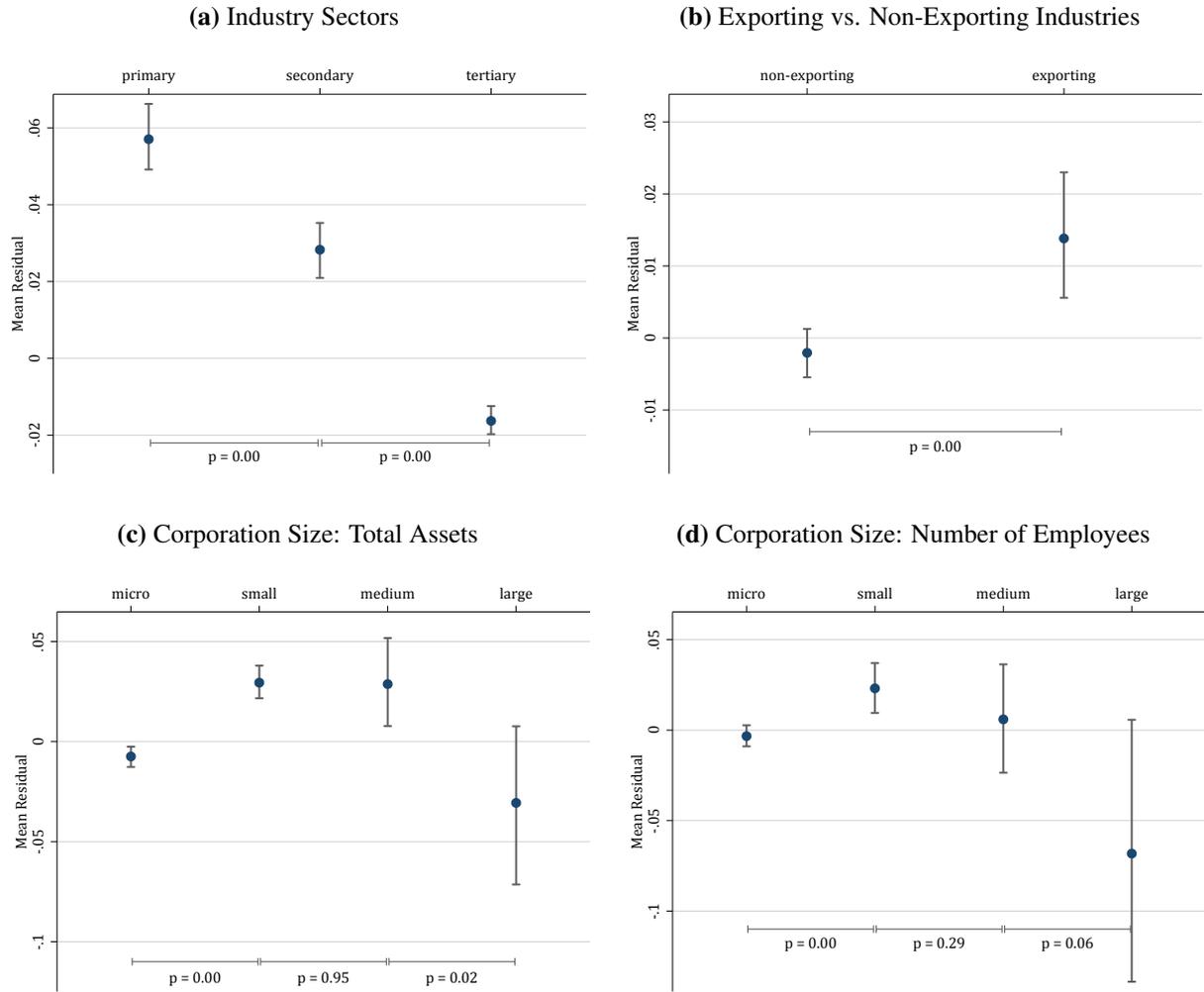
<sup>33</sup>In Figure OA.3a in the Online Appendix we present results for the corresponding simpler difference-in-differences analyses for corporations. The point estimate for the full period of threat is -0.38, which corresponds to an average reduction of tax debt by 11% ( $0.38 \times 29.3\%$ ). This is slightly larger than the reduction of 8.5%, that we calculated based on the monthly estimations in Table 2.

reputation in Slovenia compared with exporting industries. Thus, we expect corporations in non-exporting industries to more strongly respond to the policy. Third, compared with medium-sized corporations, large corporations have high visibility such that the social costs of shaming may be particularly large. Micro corporations, at the other end of the size spectrum, may also be particularly responsive to the shaming threat as their responsibilities are less distributed (and there are fewer people to blame for tax debt). Table A.1 in the Appendix provides the descriptive statistics on industry heterogeneity with respect to these sources of reputational concerns.

To investigate the heterogeneous treatment responses, we proceed in two steps. Firstly, we estimate the average effect of the shaming threat, including individual fixed effects (as in column (4) in Table 2). Secondly, based on the fitted values from the difference-in-differences estimation, we predict the residual for each taxpayer and point in time. That is, we consider the difference between the observed and estimated reductions in tax debt. Negative residuals indicate taxpayers that reduce tax debt more than predicted by the average effect; positive residuals indicate taxpayers that reduce tax debt less than predicted by the average effect. We use this insight to check whether the treatment responses are heterogeneous. We compare the average residuals for subgroups of taxpayers and gauge whether the effects differ by sector, exporting status, and size. Figure 10 displays the results. Panel (a) shows that corporations in the tertiary sector reduce tax debt more than those in the primary and secondary sectors. Panel (b) reveals the impact of the shaming threat to be larger for corporations in non-exporting industries compared with corporations in exporting industries. Finally, Panels (c) and (d) investigate whether the impact of the shaming law differs by size. We measure corporation size by the number of employees and capital (both in 2011). We find a U-shaped relationship between size and the effect of the shaming threat. The residuals are particularly negative for micro and large corporations, which indicates an above-average response among these taxpayers. Most of the pairwise comparisons reveal statistically significant differences; the  $p$ -values of the  $t$ -tests are in the figure. We note that financial constraints cannot drive our results. When estimating the average effect of the shaming threat, we include individual fixed effects, which purge any observed and unobserved differences between taxpayers (such as financial constraints). All our heterogeneity analyses are thus consistent with the assertion that the impact of the shaming threat should vary with the social costs of being named-and-shamed.

Industry sector information is unavailable for the self-employed so that we cannot provide comparable analyses for these taxpayers. What we can study, however, is whether the behavioral response of the self-employed to the shaming threat differs between sexes. There is a growing body of literature that provides evidence on the importance of gender stereotypes and gender identity for economic decisions (Akerlof and Kranton 2000; Bénabou and Tirole 2006; Bursztyn et al. 2017). Thus, the shaming law may entail gender-specific behavioral responses if society applies different standards to non-compliance of women and men.

**Figure 10: Heterogeneous Impact of the Shaming Threat: Corporations**



*Notes:* The figure displays the average residual by subgroup. In the underlying regression, we estimate the effect of the shaming threat, including individual fixed effects to purge any time-invariant differences between taxpayers (Table 2, column (4)). Negative (positive) residuals indicate a stronger (weaker) response to the threat of shaming than the average response estimated in the full sample. We consider the following dimensions of heterogeneity. Panel (a): corporations in the primary, secondary, and tertiary sectors, Panel (b): non-exporting vs. exporting industries, Panels (c) and (d): micro, small, medium-sized, and large corporations. Corporation size in Panel (c) is based on total assets in million EUR in 2011 (micro: <350,000, small:  $\geq 350,000$  and <4 million, medium-sized:  $\geq 4$  million and <20 million, large:  $\geq 20$  million). Corporation size in Panel (d) is based on the number of employees in 2011 (micro: < 10, small:  $\geq 10$  and < 50, medium-sized:  $\geq 50$  and < 250, large:  $\geq 250$ ). The whiskers indicate the 95% confidence intervals (bootstrapped with 400 replications).

Figure A.9 examines this possibility, by presenting the estimated effects of the shaming threat on tax debt for women and men separately. All estimated coefficients are virtually identical for the two sexes. These null differences suggest social costs of naming-and-shaming to be similar between sexes in our context.

In summary, we find the threat of shaming to cause an economically and statistically significant reduction of tax debt and of the probability of being in debt both for corporations and for the self-employed. We take this as evidence that taxpayers have been aware of the social norm of paying taxes on time but failed to comply. The large response to the threat of shaming is consistent with the interpretation that social pressure (and not peer comparisons) is the mechanism through which shaming policies affect behavior. There is no

heterogeneity between sexes but large heterogeneity in the effect across industries and corporations. The latter implies that the shaming policy has significant distributional effects.

## 5. Impact of Actual Shaming

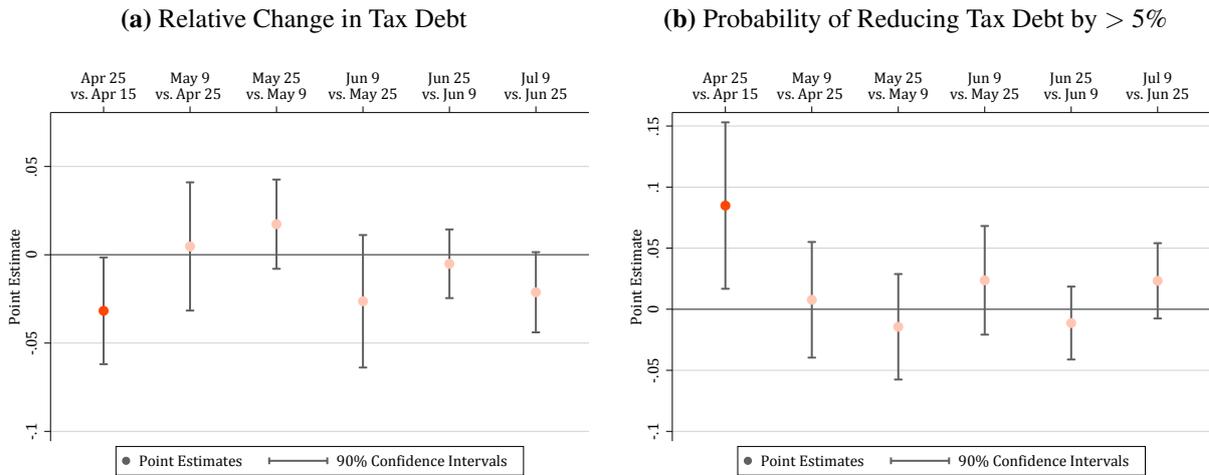
The first shaming list published on the website of the tax administration on April 15, 2013 named-and-shamed 4,476 corporations (and 5,091 self-employed). Actual shaming may have reduced tax debt among shamed tax delinquents if it conveyed a stronger social norm or if the social costs of violating the norm were larger than anticipated. (Of course, it may have also increased such tax debt among previous compliers as we discuss in Section 6.)

As noted earlier, our analysis focuses on corporations (as we lack information on industry or comparable variables to determine the reference group for self-employed individuals). Figure 11 presents our results on how tax debt is causally affected by the first shaming list published on April 15, 2013. In addition to the relative change in tax debt (Panel (a)), we also consider a coarser tax payment outcome that gives us more statistical power: a dummy variable equal to one if the taxpayer reduces tax debt by more than 5% (Panel (b)). We consider two-week periods during which taxpayers may respond: responses until the 25<sup>th</sup> of a month and responses between the 26<sup>th</sup> and the 9<sup>th</sup> of the following month. The reason is that the shaming law sets strong incentives on the timing of the response of shamed tax delinquents: They can only avoid being named-and-shamed again on the ensuing list if they reduce their tax debts below €5,000 by the 25<sup>th</sup> of the month. We find that actual shaming has an economically and statistically effect on tax debt of shamed tax delinquents immediately after the publication of the list. Among shamed tax delinquents the first shaming list: (i) reduces tax debt; (ii) increases the likelihood they reduce their tax debt by more than 5%; (iii) increases the likelihood they reduce their tax debt by more than 10% (unreported results). All these results are qualitatively similar if we control for industry growth (although we somewhat lose statistical significance). However, Figure 11 also shows that actual shaming has a limited impact on tax debt over time. Indeed, the tax debt-reducing impact is confined to the first two weeks after the publication. In that time period, tax debt is reduced by 3.2%, which corresponds to additional tax revenue of €2.1 million.<sup>34</sup> Compared with the impact of the shaming threat, the effects of actual shaming are thus modest. There are three reasons: (i) fewer taxpayers affected; (ii) smaller behavioral responses; (iii) short-lived impact. In further, unreported regressions we test whether later shaming lists affected tax debt reductions. As expected, the estimates are close to zero and statistically insignificant. This finding is consistent with social learning,

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<sup>34</sup>Total tax debt of the shamed corporations on April 15, 2013 amounted to €170 million. On average, 39.4% of non-shamed corporations improved their tax payment discipline. The impact of actual shaming on total tax debt is thus given by  $-0.032 \times 0.394 \times €170 \text{ million} = -€2.1 \text{ million}$ .

**Figure 11: Effect of Actual Shaming Through Social Learning: Corporations**



*Notes:* Robust standard errors are in parentheses. Social learning is measured by the share of taxpayers in the group whose relative reduction in tax debt after the publication of the shaming list is larger than before (or whose relative increase in tax debt is smaller than before), see equation (6). Social learning is calculated among non-shamed taxpayers to avoid endogeneity as explained in the main text, focusing on taxpayers with strictly positive tax debt both before shaming and on the publication date of the shaming list. Panel (a) displays the effects on tax debt and Panel (b) the effects on the probability of reducing tax debt by more than 5%. *Sample:* All corporations shamed on the first shaming list on April 15, 2013.

which should change taxpayer behavior only once (when information on the behavior of others and on the social costs of being shamed become public knowledge).<sup>35</sup>

Taxpayers may be unwilling or unable to pay their tax debt. The small behavioral response to actual shaming is consistent with either of the two. In the following, we additionally exploit commercial data to disentangle the two. We rely on the commercial database ORBIS which is compiled by Bureau van Dijk. The database provides information on a firm's balance sheet and profit and loss account. The ORBIS database and the shaming list both provide the value added tax identification number of firms. We use the identifier to match ORBIS data for firms in Slovenia to a dummy variable indicating whether the firm was shamed.<sup>36</sup> We can match 546 firms out of 10,666 firms in ORBIS for which information on the amount of current assets is available. This corresponds to 5.1% of the Slovenian firms in ORBIS, which is comparable to the population share of corporations on the shaming list (5.7%).

Table 6 provides statistics on firm size, financial health and liquidity both for shamed and non-shamed firms in ORBIS. In terms of average number of employees, shamed firms are slightly smaller compared to non-shamed firms (35 vs. 41 employees); yet, we cannot reject the null hypothesis that the two types of firms are equal. While the average total assets of shamed firms are about half as large as average total assets for non-shamed firms (€4798.3 vs. €9795.7), the median shamed firm is larger than the median

<sup>35</sup>By contrast, if salience was the mechanism at play, we would also expect later lists to have an impact. We caution, however, that statistical power in these additional regressions is limited, which prevents us from drawing too strong conclusions.

<sup>36</sup>We use the shaming list published on June 15, 2018, which is the earliest non-anonymized shaming list we have access to. Older shaming lists are only available to us in an anonymized way which impedes the data matching. We note, however, that the composition of shaming lists hardly changed over time.

**Table 6: Statistics on Non-Shamed vs. Shamed Firms**

	Non-shamed firms			Shamed firms			Comparison ( <i>p</i> -value)	
	Mean	Median	# Taxpayers	Mean	Median	# Taxpayers	Mean	Median
# employees	40.7	15	9154	34.9	16	408	0.339	0.185
Total assets (in €)	9795.7	1768	10145	4798.3	2549	547	0.001	0.001
EBITDA (in €)	736.6	162	9548	-64.0	15.5	448	0.001	0.001
Cash flow (in €)	616.5	141	9091	-370.7	-13	443	0.001	0.001
Current ratio	2.206	1.14	9855	1.111	0.56	512	0.001	0.001
Interest coverage ratio	135.5	38.66	988	23.3	-0.74	280	0.001	0.001

*Notes:* EBITDA refers to earnings before interests, taxes, depreciation and amortisation. Cash flow is the sum of net profit and depreciation and amortization costs. The Current Ratio is the ratio of (current assets - stock of inventories) to current liabilities. Interest coverage is the ratio of the operating profit to interest expense. *p*-values are based on unpaired two sample *t*-tests with unequal variances (means) and nonparametric K-sample tests (medians).

non-shamed firm (€2549 vs. €1768). Both differences are statistically significant. Next, we compare the financial health of shamed and non-shamed firms. While non-shamed firms exhibit both positive EBITDA and positive cash flow, we find negative average values for shamed firms. That is, the average shamed firm spends more cash than it takes in. The same applies to the median shamed firm. The potentially impaired financial health of shamed firms also shows up in the current ratio, which measures a firm's ability to pay obligations in the near-term. It is a common measure of the short-term liquidity of a business. Even though the optimal current ratio depends on the business activity, a current ratio of around 2 is generally considered healthy. This is about the average value we observe for non-shamed firms (2.2), while shamed firms exhibit an average value considerably below (1.1).<sup>37</sup> Also, the median shamed firm has a significantly lower current ratio (current ratio of 0.56 compared to 1.14 for the median non-shamed firm). Finally, we study firms' interest coverage ratios. The lower the interest coverage ratio, the more a firm is burdened by debt expenses. The average interest coverage ratio of shamed firms is about one sixth of that of non-shamed firms (and even negative for the median shamed firm due to negative operating profit). That is, interest expenses and debt repayments are more burdensome for shamed firms. All of these descriptives are consistent with the notion that financial constraints are important among shamed firms. As a consequence, a significant fraction of shamed taxpayers may be unable to pay their tax debt as opposed to simply unwilling.<sup>38</sup> Actual shaming may thus entail important welfare effects.

<sup>37</sup>This result is robust to controlling for industry composition. Including industry fixed effects we find that, on average, the current ratio of shamed firms is 1.14 lower than that of non-shamed firms (*p*-value of 0.001).

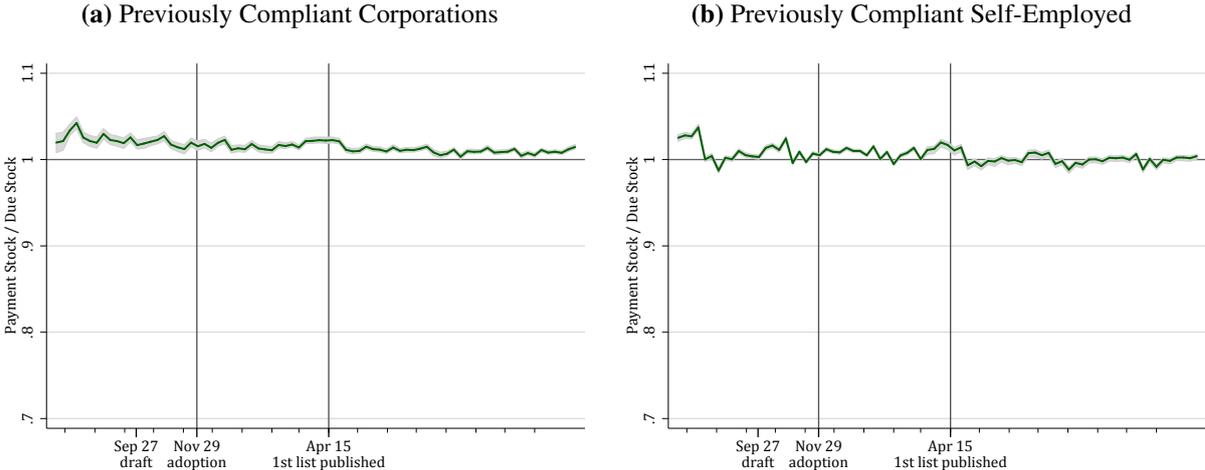
<sup>38</sup>This is in line with anecdotal evidence. Local newspapers reported that a large number of shamed firms had problems with due payments earlier on (e.g., [Gorenjski Glas 2013](#)).

**6. (No) Contagion Effects**

The disclosure of tax delinquents can have adverse effects on previously compliant taxpayers (see [Blau-fus et al. 2017](#); [Doerrenberg and Peichl 2018](#), for evidence from the laboratory and from a randomized survey experiment, respectively). Compliant taxpayers may learn that the number of delinquent taxpayers and their amounts due are larger than they anticipated. The published information could then weaken the social norm of paying taxes on time (see [Gino et al. 2009](#), who find unethical behavior to be contagious).

To explore the effects of the shaming lists on previously compliant taxpayer, we again study the ratio between total payments made (payment stock) and total amount due (due stock)—this time for previous compliers with zero shaming probability. Figure 12 shows the payment-due-ratio for corporations (Panel (a)) and for self-employed individuals (Panel (b)) between July 1, 2012 and December 31, 2013. Before the publication of the first shaming list on April 15, 2013, the payment-due-ratio in both panels is larger than one almost always. That is, the depicted corporations and self-employed individuals pay their taxes before they become due. For corporations, the payment-due-ratio is still above one after the first shaming list. That is, there is no evidence for contagion among corporations. For the self-employed, the payment-due-ratio slightly declines to values around one with the implementation of the shaming law. Naming-and-shaming may thus have slightly deteriorated tax payment discipline among the self-employed, if at all. We find very similar patterns for the corporations and the self-employed with strictly positive shaming probability below 20% (results unreported). While all these findings show that contagion is not an issue in our setting, they do not imply that contagion is a non-trivial issue in other settings.

**Figure 12: Negligible Contagion Effects**



*Notes:* The figure displays the ratio between total payments made (payment stock) and total amount due (due stock, i.e. the sum of all tax items due) on a given date. Panel (a) refers to corporations and Panel (b) to self-employed individuals. The figure covers July 1, 2012 to December 31, 2013. The stocks are calculated for each date between July 1, 2012 and December 31, 2013. A ratio of 1 means that all tax items are paid on time. A ratio less than 1 means that a taxpayer accumulates tax debt. A ratio greater than 1 means that a taxpayer reduces tax debt or a previously compliant taxpayer makes tax payments before the due date. Grey areas depict the 95% confidence intervals (bootstrapped with 400 replications).  
*Sample:* All taxpayers with zero shaming probability.

## 7. Conclusion

This study contributes to the emerging literature on the non-pecuniary motives for compliance ([Luttmer and Singhal 2014](#)), in particular on public shaming. While over half of US states and many tax authorities worldwide make ample use of public shaming as a penalty for non-compliance, empirical evidence on how a new shaming policy affects behavior is still scarce. We advance the literature by showing that not only individuals but also corporations starkly respond to public shaming by reducing their tax debt. This is an important insight as corporations (and not individuals) account for most unpaid taxes, which many tax administrations aim to enforce with the policy. The novel naming-and-shaming policy that we exploit was announced four months before its implementation. This allows us to differentiate between responses to the threat of shaming and those to actual shaming, and thus to speak to what actually makes the policy work. The evidence in the paper suggests that taxpayers have been aware of the social norm of paying taxes on time but failed to comply.

We conclude by highlighting two directions for future research. First, our finding that taxpayers significantly reduce their tax debt in response to the threat of shaming but less so in response to actual shaming suggests a need for more research to optimally design the policy. In particular, we need to understand how behavior changes with the amounts of tax debt that the shaming law brands as socially unacceptable as well as with the number of taxpayers shamed.

Second, more research is needed to better understand the mechanisms underlying the behavioral response. We have provided evidence that large corporations and taxpayers in industries selling to customers most strongly respond to the shaming policy. Are taxpayers signaling socially responsible behavior? Or are they trying to avoid unfavorable signals on financial health? More generally, are reputational concerns hedonic or purely instrumental ([Bursztyn and Jensen 2017](#))? Beyond establishing that social pressure is an important determinant of compliance behavior of individuals and firms in this study, further research is needed to better describe the underlying determinants of shaming and social pressure.

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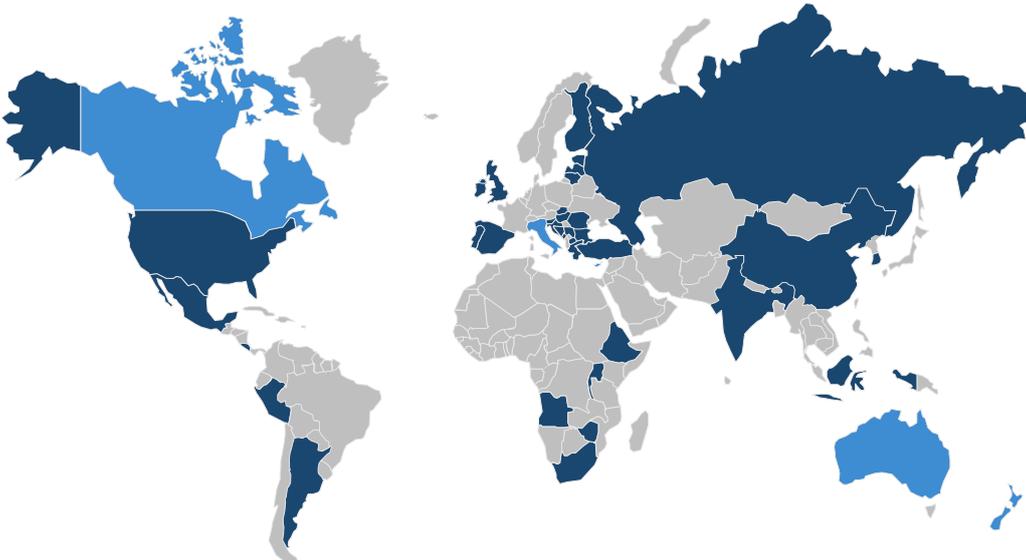
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Appendix

Figure A.1: Shaming Policies are Widely Used to Enforce Taxes



*Notes:* The areas shaded in dark blue depict countries that have shamed or still shame tax delinquents and/or tax evaders. While some countries shame taxpayers in newspapers or on the Internet, others employ unconventional shaming strategies such as sending drummers to the houses of delinquent taxpayers. The areas shaded in light blue depict countries that have the possibility to shame taxpayers (Cyprus, Malta) and countries that have not directly shamed taxpayers but have passed on taxpayer information to the local media. The remaining countries either do not employ shaming or no information on the use of shaming has been available.

**Figure A.2: Shaming List Screenshot (Slovenian Original)**

REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA FINANCE  
FINANČNA UPRAVA REPUBLIKE SLOVENIJE

ZADNJE OBJAVE
KONTAKTI
DAVKI IN DAJATVE
STORITVE IN POSTOPKI
MEDIJSKO SREDIŠČE
O FINANČNI UPRAVI

**NEPLAČNIKI NA DAN 25.1.2018 - FIZIČNE OSEBE Z DEJAVNOSTJO - RAZVRŠČENE PO ABECEDI**

Finančna uprava RS javno objavlja seznam davčnih zavezancev z zapadlimi neplačnimi davčnimi obveznostmi, ki na 25. dan v mesecu pred mesecem objave presegajo 5.000 EUR in so starejše od 90 dni. Namen objave je krepitev davčne kulture, izboljšanje plačilne discipline ter povečanje prostovoljnega, pravnega in pravočasnega obračunavanja in plačevanja davčnih obveznosti.

Tistim zavezanecem, ki davka niso zmožni plačati zaradi utemeljenih oziroma objektivnih razlogov, na katere sami niso mogli vplivati, pa že obstoječa zakonodaja omogoča možnost [odpisa, delnega odpisa, odloqa oziroma obročnega plačevanja](#) in jih v teh primerih (če jim je vloga odobrena) ne obravnava kot dolžnike.

Seznam neplačnikov davkov je razvrščen v deset velikostnih razredov in bo mesečno objavljen na spletni strani FURS najpozneje do 10. v mesecu. Stari seznam bo z objavo novega seznama umaknjen s spletne strani.

Pravna podlaga za objavo seznama je v 20. členu Zakona o spremembah in dopolnitvah Zakona o davčnem postopku (ZDavP-2F, Uradni list RS, št. 94/2012), kjer je navedenih tudi več podrobnosti.

V primeru, da imajo javno objavljeni davčni zavezanci glede navedenih podatkov kakšno vprašanje, ga lahko naslovijo na elektronski naslov: [neplacniki.fu@gov.si](mailto:neplacniki.fu@gov.si)

Po navodilih Informacijskega pooblaščenca je seznam neplačnikov oblikovan v jpg formatu, ki onemogoča indeksiranje podatkov.

[Neplačniki pravne osebe – iskanje po abecedi](#)

[Davčni zavezanci, ki so v insolventnih postopkih](#)  
(zavezanci, nad katerimi je začel postopek stečaja ali prisilne poravnave)

[Davčni zavezanci, ki niso v insolventnih postopkih](#)  
(zavezanci, ki niso v postopku stečaja ali prisilne poravnave)

**Neplačniki fizične osebe z dejavnostjo z začetnico dejavnosti A na dan 25.1.2018**

[Prejšnja stran](#) [Vstopna stran](#) [Naslednja stran](#) [Razredi neplačnikov](#)

F03	[REDACTED]
F03	[REDACTED]
F02	[REDACTED]
F03	[REDACTED]
F03	[REDACTED]
F01	[REDACTED]
F01	[REDACTED]
F01	[REDACTED]
F03	[REDACTED]
F02	[REDACTED]
F02	[REDACTED]
F04	[REDACTED]
F03	[REDACTED]
F02	[REDACTED]
F04	[REDACTED]
F01	[REDACTED]

Notes: Screenshot of the Slovenian online shaming list. Source: [http://sezname.gov.si/DURS/main\\_neplacniki\\_po\\_abc.html](http://sezname.gov.si/DURS/main_neplacniki_po_abc.html), accessed on February 1, 2018.

**Figure A.3: Shaming List Screenshot (English Translation)**

REPUBLICA SLOVENIJA  
MINISTRSTVO ZA FINANCE  
FINANČNA UPRAVA REPUBLIKE SLOVENIJE

ZADNJE OBJAVE KONTAKTI DAVKI IN DAJATVE STORITVE IN POSTOPKI MEDIJSKO SREDIŠČE O FINANČNI UPRAVI

### NON-PAYERS AS OF 25.1.2018 - NATURAL PERSONS WITH AN ACTIVITY – IN ALPHABETICAL ORDER

Financial Administration of the Republic of Slovenia publicly releases the list of taxpayers with unpaid due tax liabilities which on 25th day of the month before the month of publication exceed 5,000 euros and are older than 90 days. The purpose of the publication is to strengthen the tax culture, improve the payment discipline and to promote voluntary, regular and on-time calculation and payment of tax liabilities.

For those taxpayers who are not able to pay the tax for valid or objective reasons that they could not influence themselves, the possibility of [remission, partial remission, suspension or payment in instalments](#) is provided already by the existing legislation. Therefore, the taxpayers in these cases (if the application is approved) are not considered as debtors.

The list of tax non-payers is broken down into ten groups by size classes and will be published monthly on the website of FURS no later than on the 10th of the month. With the publication of the new list, the old one will be removed from the website.

The legal basis for the publication of the list is included in the Article 20 of the Act Amending the Tax Procedure Act (ZDavP-2F, Official Gazette of the Republic of Slovenia No 94/2012) where more details are given.

For any questions related to the published data, the taxpayers included in the list may send an e-mail to the following address: [neplacniki.fu@gov.si](mailto:neplacniki.fu@gov.si)

As instructed by the Information Commissioner, the list of non-payers is designed in jpg format in order to prevent data indexing.

[Non-payers legal persons – search by alphabet](#)

[Taxpayers in insolvency proceedings](#)  
(taxpayers against which bankruptcy or arrangement proceedings have been initiated)

[Taxpayers that are not in insolvency proceedings](#)  
(taxpayers against which bankruptcy or arrangement proceedings have not been initiated)

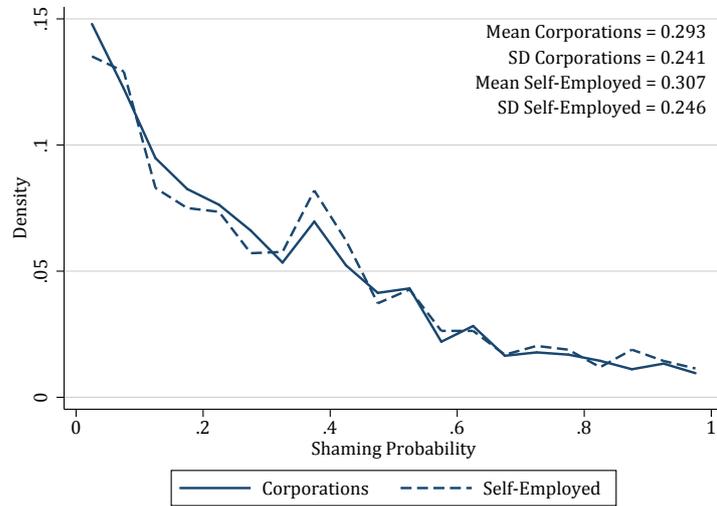
Active, non-paying natural persons with A as first letter of last name as of 25th of January 2018

[Previous page](#) [Start page](#) [Next page](#) [Classes of non-payers](#)

F03	[REDACTED]
F03	[REDACTED]
F02	[REDACTED]
F03	[REDACTED]
F03	[REDACTED]
F01	[REDACTED]
F01	[REDACTED]
F01	[REDACTED]
F03	[REDACTED]
F02	[REDACTED]
F02	[REDACTED]
F04	[REDACTED]
F03	[REDACTED]
F02	[REDACTED]
F04	[REDACTED]
F01	[REDACTED]

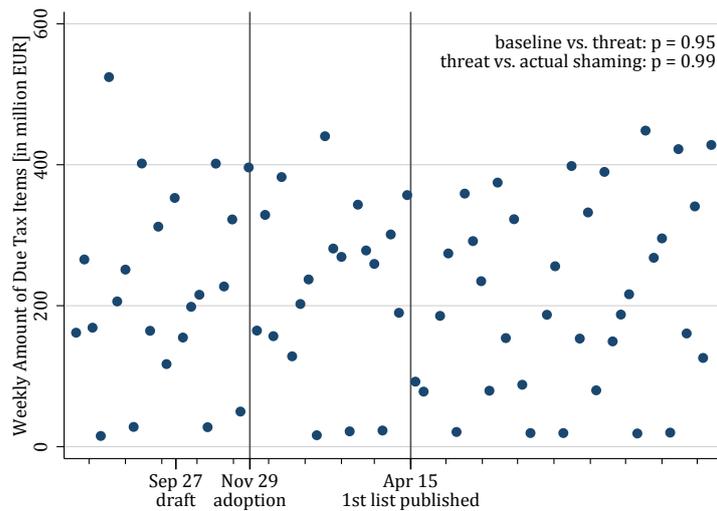
Notes: Screenshot of an English translation of the Slovenian online shaming list. Source: [http://sezname.gov.si/DURS/main\\_neplacniki\\_po\\_abc.html](http://sezname.gov.si/DURS/main_neplacniki_po_abc.html), accessed on February 1, 2018.

**Figure A.4: Distribution of the Shaming Probability**



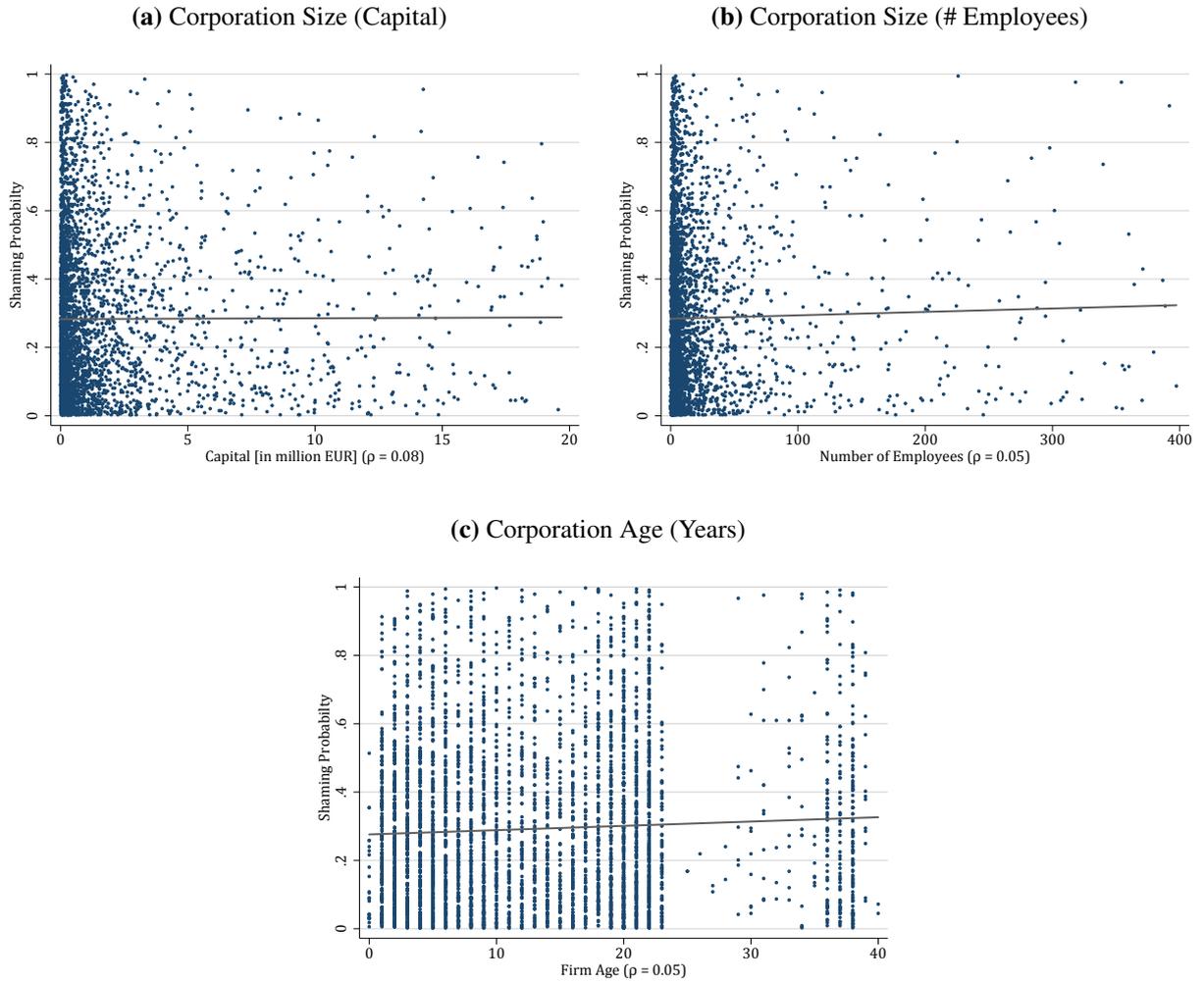
*Notes:* The figure displays the raw distribution of the shaming probability as defined in equation (1). The sample consists of all corporations and all self-employed persons with a shaming probability strictly above 0% and strictly below 100%.

**Figure A.5: Weekly Due Tax Items (July 2012–December 2013)**



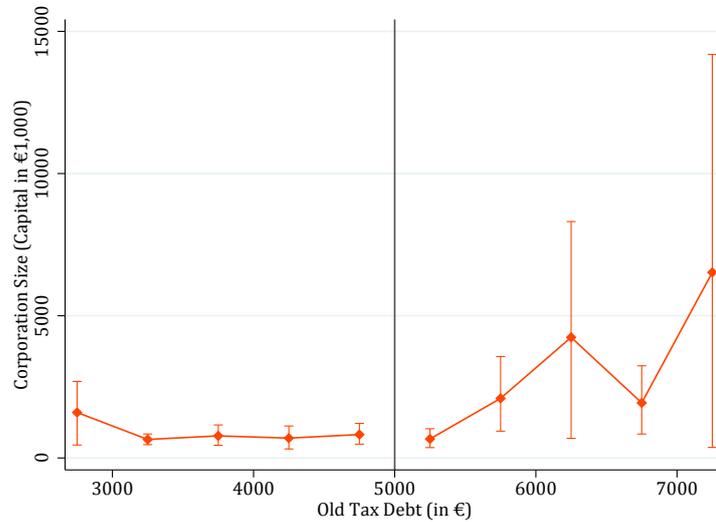
*Notes:* This figure plots the weekly sum of due tax items. Chow test  $p$ -values (top right corner) test for structural breaks on Nov 29, 2012 (adoption of the shaming law) and Apr 15, 2013 (publication of the first shaming list).

**Figure A.6: Shaming Probability Correlation Graphs**



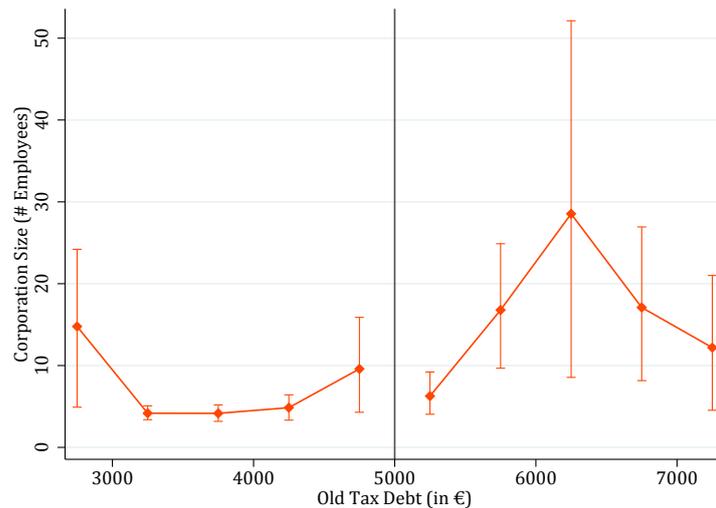
*Notes:* The figures show the correlation between the shaming probability and corporation characteristics. The graphical representations exclude observations with capital > 20,000,000 in Panel (a), number of employees > 400 in Panel (b), and age > 40 in Panel (c) due to scaling. The Pearson correlation coefficients  $\rho$  are based on the full samples.

**Figure A.7: No Discontinuity for Corporation Size: Capital**



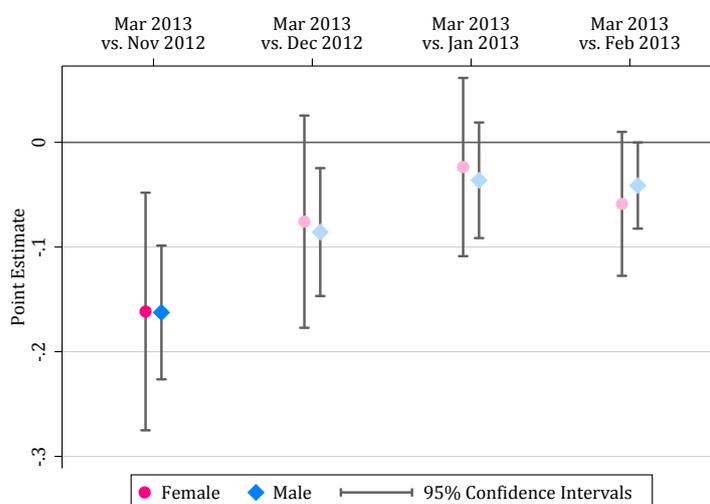
*Notes:* This figure shows the size of corporations in terms of capital for corporations with old tax debt slightly below or above the shaming threshold of €5,000 on November 29, 2012 (the day of adoption of the shaming law). For each tax debt bin the orange diamonds show the average amount of capital in 2012. Whiskers indicate bootstrapped 95% confidence intervals (400 replications). The bin size is €500. The figure excludes corporations with shaming probability of 1.

**Figure A.8: No Discontinuity for Corporation Size: Number of Employees**



*Notes:* This figure shows the size of corporations in terms of number of employees for corporations with old tax debt slightly below or above the shaming threshold of €5,000 on November 29, 2012 (the day of adoption of the shaming law). For each tax debt bin the orange diamonds show the average number of employees in 2012. Whiskers indicate bootstrapped 95% confidence intervals (400 replications). The bin size is €500. The figure excludes corporations with shaming probability of 1.

**Figure A.9:** Effect of the Shaming Threat: Female vs. Male Self-Employed Individuals



*Notes:* The figure displays the effect of the shaming threat on tax debt separately for women (pink dots) and men (blue dots). The estimation follows that in Figure 9, but differentiating between women and men. Tax debt refers to tax debt older than 90 days. The first dots (printed in bright pink and blue) show the coefficient for the full period of threat. The subsequent dots (printed in lighter pink and blue) show the corresponding coefficients by subperiod. The whiskers indicate the 95% confidence intervals (with robust standard errors).

**Table A.1:** Descriptive Statistics of Industry Heterogeneity: Corporations

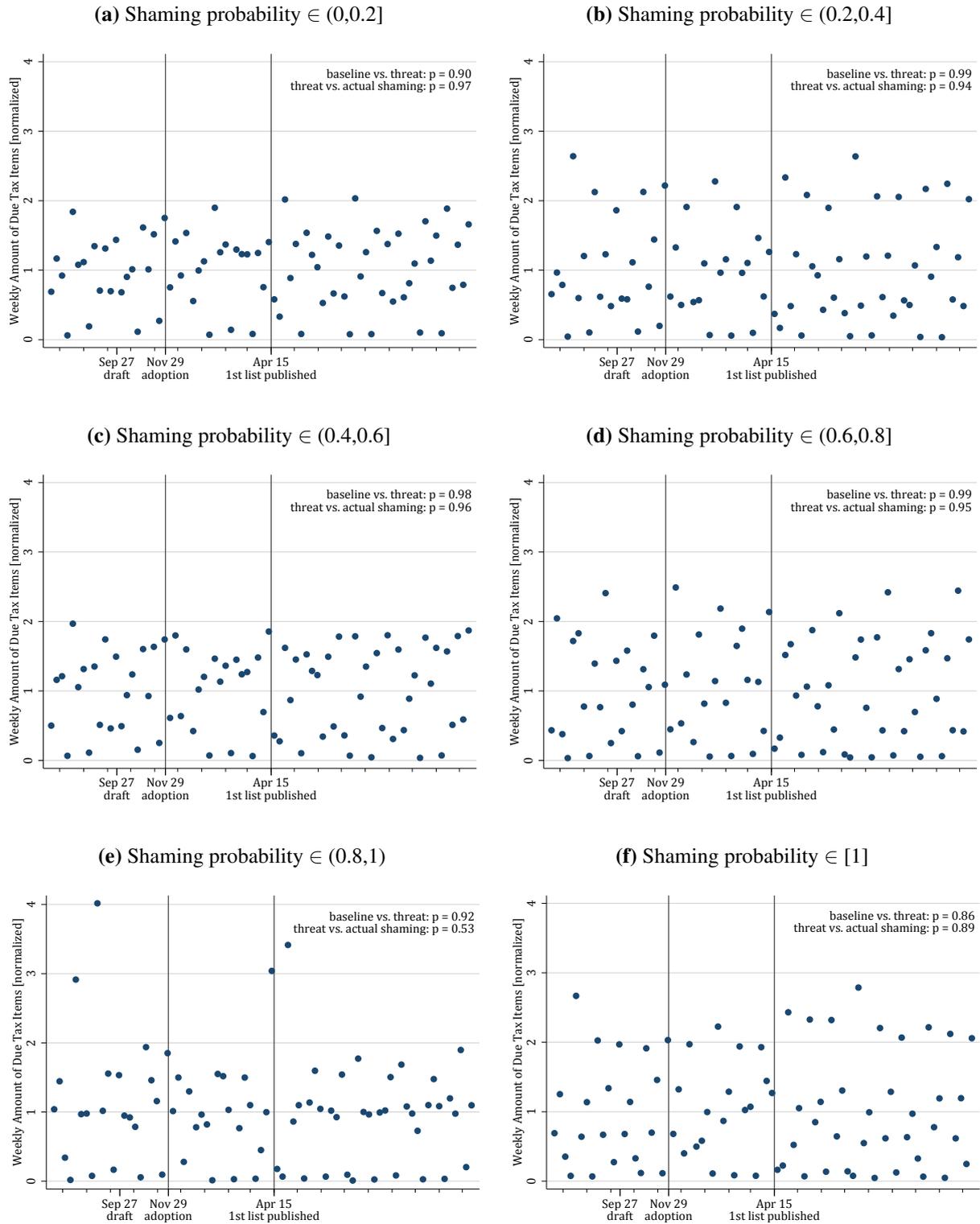
Industry	Industry Sector	Exporting Industry	# of Corp.
accommodation, food service activities	tertiary	no	3,072
activities of extraterritorial organisations and bodies	tertiary	no	48
administrative and support service activities	tertiary	no	1,991
agriculture, forestry, fishing	primary	yes	819
arts, entertainment, recreation	tertiary	yes	3,244
construction	primary	no	8,607
education	tertiary	no	2,061
electricity, gas, steam, air conditioning supply	secondary	yes	701
financial and insurance activities	tertiary	no	1,286
health, social work	tertiary	no	1,776
information, communication	tertiary	yes	3,541
manufacturing	secondary	yes	7,647
mining, quarrying	primary	yes	75
other service activities	tertiary	no	5,982
professional, scientific and technical activities	tertiary	yes	13,133
public administration, defence, [...]	tertiary	no	1,616
real estate	tertiary	no	2,019
transportation, storage	secondary	no	4,094
water supply, sewerage, waste management, [...]	secondary	yes	354
wholesale, retail trade, repair of motor vehicles	tertiary	no	15,512
All			77,578

*Notes:* Age, capital, and the number of employees are the mean values for corporations with non-missing values.

Sample: All corporations with a shaming probability below 100%.

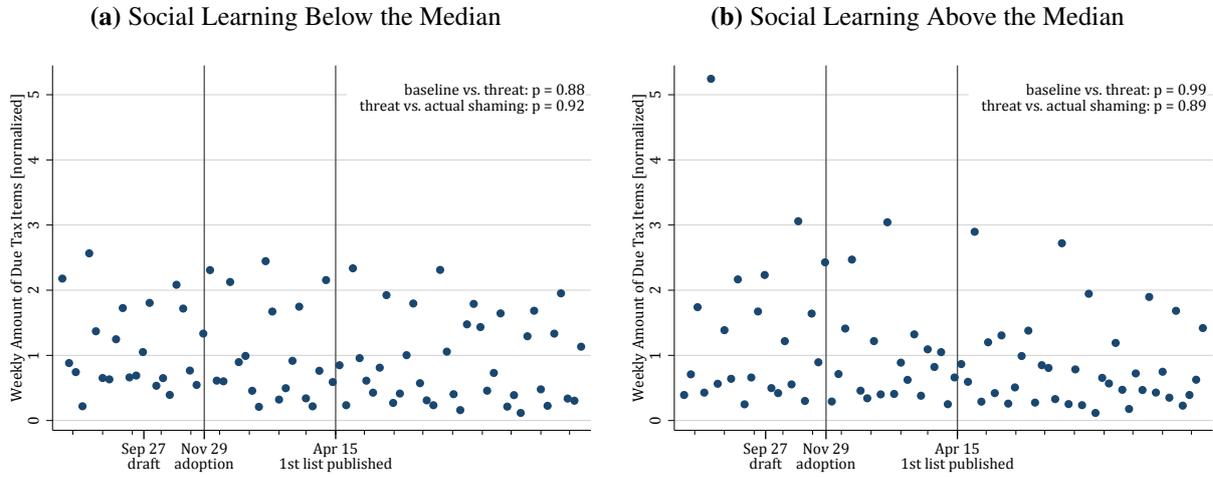
Online Appendix: Not for Publication

Figure OA.1: Weekly Due Tax Items by Shaming Probability Group: Corporations



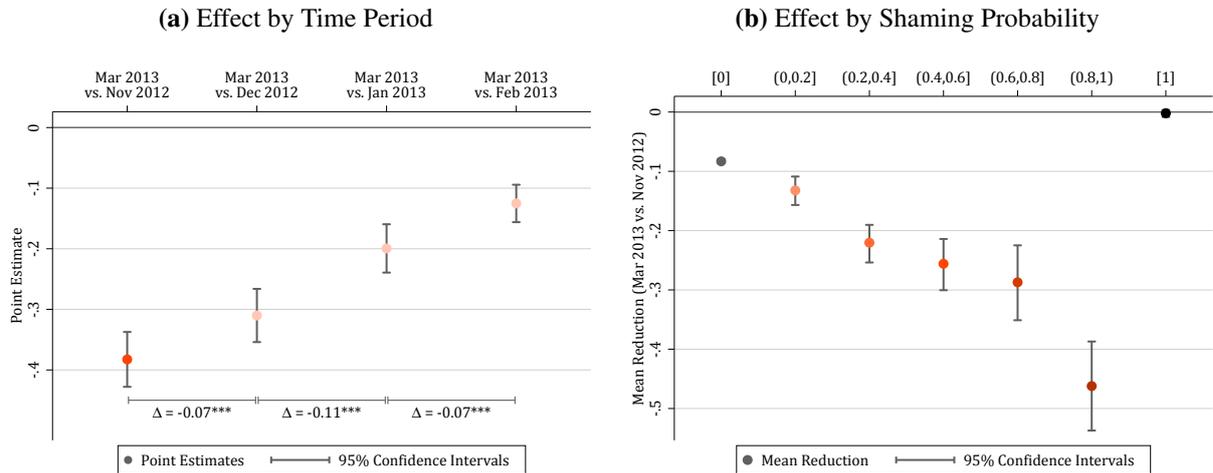
Notes: These figures plot the weekly sum of due tax items for different groups of corporations based on their shaming probability. The values are normalized by the mean value of weekly due tax items within each group. The figure covers July 1, 2012 to December 31, 2013. Chow test  $p$ -values (top right corners) test for structural breaks on Nov 29, 2012 (adoption of the shaming law) and Apr 15, 2013 (publication of the first shaming list).

**Figure OA.2: Weekly Due Tax Items by Degree of Social Learning: Corporations**



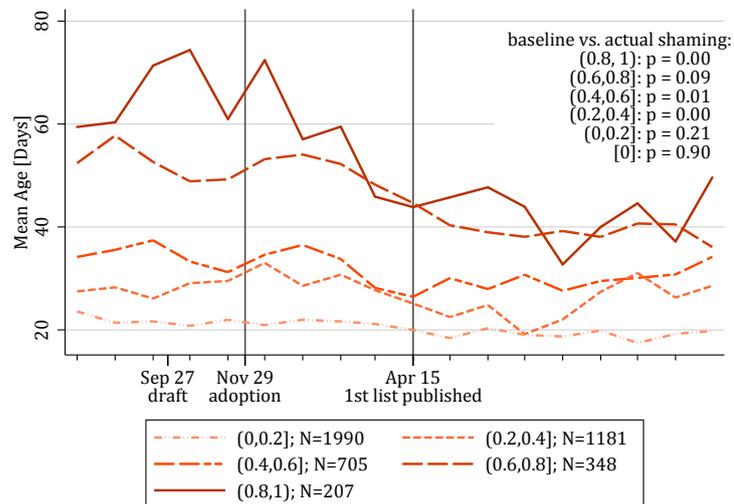
*Notes:* These figures plot the weekly sum of due tax items for corporations by degree of social learning. We calculate social learning among the non-shamed taxpayers according to equation (6). The weekly sum of due tax items is normalized by the mean value of weekly due tax items within each group. The figure covers July 1, 2012 to December 31, 2013. Chow test  $p$ -values (top right corners) test for structural breaks on Nov 29, 2012 (adoption of the shaming law) and Apr 15, 2013 (publication of the first shaming list).

**Figure OA.3: Effect of the Shaming Threat: Corporations**



*Notes:* Panel (a) displays the estimated effect of the shaming threat on tax debt, focusing on various time comparisons. Tax debt refers to tax debt older than 90 days. The coefficients are estimated as in column (1) in Table 2, but with the overall change in tax debt between the two indicated dates (instead of considering all monthly changes in between). The first dot (printed in bright orange) shows the coefficient for the full period of threat. The subsequent dots (printed in lighter orange) show the corresponding coefficients by subperiod. The whiskers indicate the 95% confidence intervals (with robust standard errors). Each of the  $\Delta$  coefficients refers to a single month of the shaming threat. For instance,  $\Delta = -0.07^{***}$  is the estimated coefficient for the first month of shaming threat, which is statistically different from zero at 1% level. Panel (b) provides a break-down of the full effect of the shaming threat by shaming probability. Whiskers indicate the 95% confidence intervals (bootstrapped with 400 replications).

**Figure OA.4: Age of Cleared Tax Items by Shaming Probability: Corporations**



*Notes:* The figure displays the average age of the youngest tax item that taxpayers cleared in a given month by shaming probability group. The figure covers July 1, 2012 to December 31, 2013. Chow test  $p$ -values (top right corner) test for structural breaks in the age level between baseline (July 1, 2012 to Nov 28, 2012) and actual shaming (Apr 15, 2013 to Dec 31, 2013) period.