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Nudging for prompt tax penalty payment: Evidence from a field experiment in Indonesia☆

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ABSTRACT

We conduct a randomised controlled trial in Indonesia to evaluate the effect of three intervention letters on tax penalty compliance behaviour. Over 10,000 individual taxpayers are randomly assigned to receive either a deterrence, information, or simplification letter, or no letter. Our results indicate that simplification, which makes paying a penalty less burdensome administratively by providing billing codes to pay the penalties, yields the highest probability of timely settlement, increasing compliance by 32% compared to the control group. Deterrence also positively impacts penalty compliance, increasing timely settlement rates by 27%. The least effective intervention is the information letter. Although associated with a 10% increase in timely settlement, this effect is statistically insignificant at the 10% confidence level. Our results suggest that strategic messaging by tax authorities in developing countries can be a cost-effective tool for improving tax penalty payment compliance.

1. Introduction

Collecting delinquent debt is a considerable and ongoing challenge for tax administration. Data from the Indonesian Directorate General of Taxes (DJP – *Direktorat Jenderal Pajak*), for example, indicate the estimated value of tax arrears, including unpaid penalties at the end of 2019, was approximately US $3.2 billion (DJP, 2020). According to DJP data, between January 2020 and June 2021

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alone, penalty collection rates appear dangerously low, at around 10%. This issue is by no means confined to developing countries, however. In the United States, late and enforced payments from 2011 to 2013 amounted to $60 billion, of which 72% was related to individual income tax (Internal Revenue Service, 2019). In related enforcement domains, only half of UK court penalties were paid within the statutory six months (as of 2016), with outstanding court fines estimated to be over £600 million (Haynes et al., 2013). Dušek et al. (2022) report that, in Berlin, 25% of fines for minor traffic offences are not paid on time, and the equivalent figure for New York is 40%. In this study, we explore ways to reduce outstanding fines.

Outstanding fines matter for a variety of reasons. First, as fine revenue is a component of government revenue like any other, the state cannot use outstanding fines to provide public services. Arrears necessarily defer revenue and, in the presence of statutory time limits on the recovery of tax arrears (five years in Indonesia, ten years in the United States), can materialise into outright revenue losses. In Indonesia, by the end of 2019, around Indonesian Rupiah (Rp) 10.5 trillion ($750 million) of tax arrears, including tax penalties, was written off (DJP, 2020). Second, although tax authorities have significant legal powers for the recovery of debt, up to and including distraint (the seizure and sale of assets and property), these measures are themselves costly, thereby reducing the net benefit to the exchequer of pursuing these debts and making the recovery of smaller debts ungainful. On the other hand, failing to recover such debt might ultimately undermine the effective enforcement of the tax system, in which penalties are an important deterrent.

Addressing the problem of outstanding fines has two components. First, one can seek to increase the likelihood that taxpayers do not attract a fine in the first place, what is termed the "extensive margin" of tax compliance. A growing literature explores how behaviour at the extensive margin can be influenced through a mixture of legal deterrence and other non-deterrence factors – often referred to collectively as tax morale – which includes social norms, simplification, information, and moral suasion. Second, one can seek to influence the likelihood that those taxpayers who nonetheless do attract a fine pay it on time, without the need for heightened (and costly) debt recovery measures by the tax authority. Our study focuses on this second component, which so far has received much less attention in the literature.

Seeking to influence the payment behaviour of taxpayers who have already attracted a fine for failing to meet a filing or payment deadline, we perform a randomised controlled trial (RCT) amongst just over 10,000 taxpayers in Indonesia in cooperation with the DJP. All participants receive the standard communication notifying them of tax penalties (the STP – *Surat Tagihan Pajak*), as required by Indonesian tax law, but participants in treatment conditions receive an additional attachment – commonly referred to as a "nudge" (Thaler and Sunstein, 2008). The nudges we test, informed by behavioural science, are a deterrence treatment (emphasising the enforcement measures available to the DJP in the event of the penalty not being settled), a simplification treatment (aiding with the necessary codes and providing a telephone number that the taxpayer can call for assistance); and an information treatment (clarifying the various ways the taxpayer can settle the penalty).

At the outset, we were cautious as to whether nudges would be effective in this context. First, we consider taxpayers who have already either (i) filed late; (ii) filed on time but were then late in making the associated tax payment; or (iii) filed late and then also paid late. This sample of taxpayers would seem unlikely to be representative of the taxpayer population as a whole. Instead, it seems likely that the sample will be over-represented with taxpayers having low intrinsic motivation to comply, in the sense of Dwenger et al. (2016). Such taxpayers will plausibly be less likely to respond to any tax authority interventions – nudge or otherwise. Second, there are reasons to believe that the sample will be over-represented with taxpayers who have shown previous insensitivity to nudge interventions specifically. Following a major field study in Indonesia in 2017 (Persian et al., 2023), the DJP introduced nudge insights (albeit in relation to reminders and planning prompts – different to the nudges we consider) into its standard operating procedures around income tax filing. Thus, our sample is composed entirely of individuals for whom one attempt at nudging has already proved ineffective. Third, following the meta-analyses of DellaVigna and Linos (2022) and Maier et al. (2022), we were aware that many more nudge interventions yield no measurable effect than would be surmised from a reading of published studies. Last, in an influential meta-analysis, Antinyan and Asatryan (2020) report that tax compliance nudges are less effective in lower-income countries. Thus, communications that might hypothetically be impactful in a developed country context might prove inert in the Indonesian context.[1]

Perhaps surprisingly, two of the three treatments statistically increase the probability that tax penalties are paid on time relative to the control group. Simplifying the payment process produces a 4.4 percentage point (pp.) increase in the probability of prompt payment. As only 13.9% of the control group paid promptly, this represents a 32% higher probability of prompt payment. Emphasising deterrence increases the probability of timely payment by 3.7 pp., or 27%. Providing further information regarding penalty payment generated the weakest effect of the three interventions. It increases the probability of timely payment by 1.4 pp., or 10%, but the effect is not statistically significant at conventional levels. Considering the relatively large effect sizes and the relatively modest cost of producing the additional communication, a cost-benefit analysis shows that implementing either of the two most effective treatments – simplification and deterrence – is a cost-effective policy instrument.

Our findings contribute to what is so far only a small literature on the effectiveness of tax-based nudging in developing countries yet are broadly in line with evidence from developed country contexts. In particular, prior studies (reviewed in Section 2) also find that simplification letters can have an effect quantitatively comparable to (and possibly exceeding) that of deterrence letters and that providing information is less impactful than, for instance, emphasising deterrence.

This paper also connects to a broader literature seeking to understand aspects of tax compliance from a behavioural science standpoint (e.g., Hashimzade et al., 2013; Alm, 2019) and to the literature on the effects of nudges more generally (e.g., Milkman et al.,

[1] We also continue to be concerned about emerging evidence pointing to the "regular" failure of scientific standards in cooperative field experiments (Fels, 2024). This study was not produced under contract from the DJP and was pre-registered, as described elsewhere.

2021; Congiu and Moscati, 2022). It also contributes to the wider literatures on behavioural development economics (e.g., Cardenas and Carpenter, 2008; Kremer et al., 2019) and on taxation and development (e.g., Besley and Persson, 2013; Basri et al., 2021), wherein an effective tax system is found to be an important determinant of successful state-building (Fjeldstad and Moore, 2008), and of economic growth (e.g., Arnold et al., 2011).

The remainder of the paper is organised as follows: Section 2 reviews the existing literature, focusing on behavioural nudging and compliance outcomes, whilst Section 3 outlines the experimental design. Section 4 lays out the empirical methodology, and Section 5 presents the results. Section 6 concludes.

2. Nudging taxpayers

This section reviews the existing literature broadly related to the themes of this paper. A growing literature explores the possibility of influencing individual taxpayer behaviour by sending messages (Pomeranz and Vila-Belda, 2019; Slemrod, 2019).[2] Although each study is unique, various broad categories of nudges may be discerned in the literature. Building on rational economic approaches to the study of tax compliance, as embodied by the model of Allingham and Sandmo (1972), *deterrence* nudges emphasise the probability of being sanctioned for non-compliance and the nature of the sanctions that will apply. Slemrod et al. (2001) and Kleven et al. (2011) provide examples of RCTs that emphasise the probability of sanction, while Meiselman (2018) provides an example of an RCT emphasising penalty information. We perform a treatment that similarly emphasises penalty information.

Our remaining treatments are examples of *non-deterrence* nudges. Following studies such as Coleman (1997), Dwenger et al. (2016), John and Blume (2018), and De Neve et al. (2021), we communicate information to taxpayers intended to simplify the process of complying with tax law. Previous research highlights how simplifying communication can help overcome information frictions and/or "hassle costs" associated with filing and paying taxes (e.g., Kleven and Kopczuk, 2011; Hoopes et al., 2015; Benzarti, 2020).[3] Like us, Dwenger et al. (2016) and De Neve et al. (2021) find that simplifying communication positively affects compliance to a degree comparable to deterrence communication. However, the evidence is not entirely consistent: see, e.g., John and Blume (2018), who report no effect of their simplification treatment on compliance with local taxes in London.

Other non-deterrence nudges found commonly in the tax literature provide information on the compliance behaviour of others (social norms) or appeal to moral suasion (see, e.g., Pomeranz and Vila-Belda, 2019, for a review). The meta-analysis of Antinyan and Asatryan (2020), however, finds that such nudges have no measurable effect. Accordingly, we implement an information nudge that articulates the where, when, and how of prompt penalty payment.[4] The idea behind such interventions is that even taxpayers with good intentions might fail to comply due to inattention or planning failures (Rogers et al., 2015). So far, the evidence for such interventions in the tax context is mixed. On the one hand, Robitaille et al. (2021) find that information communication of this form generates positive effects on Ontario businesses that had failed to file their employer health tax return on time. On the other hand, Bott et al. (2020) detect no discernible effect on Norwegian taxpayers of a letter containing information about why and how to report foreign income.

Evidence on the effects of compliance nudges in developing countries – the focus of this paper – is much more limited than in developed countries (Mascagni, 2018). Most developing country studies are from Latin America and the Caribbean (e.g., Del Carpio, 2013; Castro and Scartascini, 2015; Lopez-Luzuriaga and Scartascini, 2019; Holz et al., 2023); Ortega and Scartascini, 2020; Mogollon et al., 2021). For Africa, we know only of Mascagni and Nell (2022) and Santoro and Mascagni (2023), both conducted in Rwanda, and Shimeles et al. (2017) for Ethiopia. In Europe, Jamison et al. (2021) nudge taxpayers in Latvia. In Asia – the region we consider – we know of only Sjahrir et al. (2020) and Persian et al. (2023) for Indonesia, Chetty et al. (2014) for Bangladesh, and Hoy et al. (2024) for Papua New Guinea.

Given that the evidence discussed above for developing countries is (i) relatively sparse, (ii) somewhat clustered by country, and (iii) largely too recent to be included in extant meta-analyses of tax nudges (e.g., Antinyan and Asatryan, 2020), proper inference of the effects of such nudges in the developing country context remains lacking. This paper contributes to filling this lacuna. These caveats regarding the existing evidence base notwithstanding, prior studies in the developing country context do typically report discernible positive effects for at least a subset of nudges. Moreover, owing to the low levels of compliance on average in the control group, the reported compliance increases can be large in percentage change terms.

As well as the developing country focus, another important distinction between this study and much of the tax-nudge literature is that we seek to influence the behaviour of individual taxpayers who have already attracted a penalty for failing to file and/or pay on time. Other tax studies to share this feature include Hallsworth et al. (2017), Gemmell and Ratto (2018), Chirico et al. (2019), and Cranor et al. (2020). Whereas, however, these studies focus on the recovery of tax debt, we analyse specifically the recovery of fine debt, distinct from tax debt. The only other studies we are aware of that focus specifically on fine debt are outside the tax context. Haynes et al. (2013) trial a variety of text messages to encourage the timely payment of UK court fines. They find positive effects from

[2] For related RCTs considering the effect of nudges on firms, rather than individuals, see, e.g., Pomeranz (2015), Carrillo et al. (2017), Biddle et al. (2018), and Gillitzer and Sinning (2020).

[3] For a related literature on the effects of complexity in the tax code itself, see, e.g., Chetty and Saez (2013) and Abeler and Jäger (2015).

[4] We were also concerned that, in the context of tax penalties, a social norm nudge may be prone to backfiring, as in, e.g., Silva and John (2017) and John and Blume (2018). Pointing out how many others engage in socially harmful behaviour may have the unintended consequence of making the behaviour natural and permissible and end up encouraging it. For a dedicated analysis of the effects of norm-nudges, see Bicchieri and Dimant (2022).

Table 1
Treatment design and assignment.

Treatment Type	Main Message	Potential Mechanism	N
Control	No intervention letter attached		5,085
Deterrence	Failure to settle the STP before the deadline may result in heightened actions by the DJP	Loss aversion; Salience	1,627
Information	States the taxpayer's outstanding STP balance and ways to settle the STP	Inattention; Complete information	1,721
Simplification	Lists the billing codes needed to pay the STP and the procedure to generate billing codes	Relax information constraints; Simplify complex procedures	1,634
Total			10,067

various communications, with the most effective nuance being to address the recipient by name. Whereas personalisation of the nudge is a treatment in Haynes et al. (2013), in our study, all communications address the taxpayer by name. Dušek et al. (2022) and Sinning and Zhang (2023) seek to nudge the payment of fines by drivers (in the Czech Republic and Australia, respectively) who have been prosecuted for traffic or parking offences. Both studies find that emphasising the fines for late payment makes penalty payment more likely.

3. The experiment

3.1. Institutional context

The experiment was performed in Indonesia, a country geographically located in southeast Asia. Despite being the largest economy in the region, Indonesia's tax-to-GDP ratio – a rough-and-ready indicator of state capacity – was just 10.1% in 2019 (OECD, 2021), ranking it below its closest neighbours, Singapore (12.8%) and Malaysia (11.4%).

We focus on civil penalties (fines) issued by the DJP. Specifically, we consider so-called "administrative" fines arising from a failure to file a tax return on time or to make a payment on time (as distinct from "criminal" fines, which arise from audit or tax crime investigations). In the case of individual taxpayers (as opposed to firms), every monthly or annual income tax return filed late attracts a fine of Rp100,000 ($6.50). In addition, overdue tax balances relating to a tax return accrue fines on a monthly basis, at a rate consistent with an annual charge equivalent to interest at fixed rate of 5%, plus a variable penalty rate set periodically by the Minister of Finance to reflect market interest rates. While such fine amounts may seem trifling in the developed country context, they are less so in Indonesian context, where GDP per capita in dollar terms is less than a tenth of that in the UK, for instance.

Taxpayers are informed of administrative fines via a STP. That fine amounts are notified and paid separate from unpaid tax arrears in the Indonesian context – rather than being bundled into a single payment item – offers an opportunity to study the repayment of fines distinct from the payment of tax. Under the standard operating procedure, active efforts by the DJP to recover penalty amounts begin eight days after a STP exceeds its thirty-day statutory deadline with the sending of a warning letter. This letter is followed by a distress warrant when the taxpayer does not respond within 21 days. Within 48 hours of the distress warrant date, assuming no payment has been received, a notice of confiscation of assets is issued: the taxpayer has 14 days to settle the penalties, or the DJP proceeds to auction their assets.[5]

When the DJP begins active debt recovery measures, it may levy an additional penalty of Rp50,000 ($3.50) per unpaid tax bill, followed by a further penalty of Rp100,000 ($6.50) per unpaid tax bill following the issue of a distress warrant. As, however, these additional penalties are insufficient to cover the cost of the debt recovery measures, the DJP is obliged to engage in debt recovery activity that is ungainful from a static perspective in order to maintain long-run dynamic incentives for compliance.

3.2. Treatment design

The experiment exploits intervention letters that aim to change taxpayer behaviour. Three intervention letters are designed, based on behaviourally informed messages in the literature on behavioural economics and individual tax compliance.

The treatment letters are delivered as physical letters, written in Indonesian. They are received as an attachment to the standard STP, for the DJP must issue the standard STP by law. The standard STP contains a general message explaining why the taxpayer is receiving a STP, details of the penalty (as in Cranor et al., 2018), and the contact details of the local tax office.[6] Delivery to taxpayers is by the approved postal service of each local tax office. The sample is assigned to four groups. The first is the control group, which receives the standard STP only. The remainder of the sample is allocated to three treatment groups: deterrence, information, and

[5] If assets cannot be auctioned the DJP can impose an overseas travel ban and/or freeze a taxpayer's bank account. In extreme cases, a taxpayer with significant amount of delinquent tax debt and with doubtful intention to settle can be imprisoned for up to a year.

[6] See Appendix 1 for an example of the standard STP in Indonesia.

Table 2
Taxpayer characteristics descriptive statistics and balance test.

	Control ($N = 5085$)	Deterrence ($N = 1627$)	Information ($N = 1721$)	Simplification ($N = 1634$)	p-value
Age of Taxpayer (years)					0.803
<20	42 (0.8%)	17 (1.0%)	14 (0.8%)	7 (0.4%)	
20–29	748 (14.7%)	235 (14.4%)	259 (15.0%)	253 (15.5%)	
30–39	1246 (24.5%)	377 (23.2%)	419 (24.3%)	377 (23.1%)	
40–49	1188 (23.4%)	400 (24.6%)	430 (25.0%)	409 (25.0%)	
>50	1861 (36.6%)	598 (36.8%)	599 (34.8%)	588 (36.0%)	
Years Registered					0.776
≤2	774 (15.2%)	246 (15.1%)	271 (15.7%)	244 (14.9%)	
>2–5	839 (16.5%)	274 (16.8%)	294 (17.1%)	274 (16.8%)	
>5–7	403 (7.9%)	114 (7.0%)	141 (8.2%)	128 (7.8%)	
>7	3069 (60.4%)	993 (61.0%)	1015 (59.0%)	988 (60.5%)	
Occupation					0.983
Employee	2760 (54.3%)	891 (54.8%)	934 (54.3%)	884 (54.1%)	
Non-employee	2325 (45.7%)	736 (45.2%)	787 (45.7%)	750 (45.9%)	
Strategic Taxpayer Status					0.592
No	5040 (99.1%)	1617 (99.4%)	1707 (99.2%)	1624 (99.4%)	
Yes	45 (0.9%)	10 (0.6%)	14 (0.8%)	10 (0.6%)	
VAT Taxpayer Status					0.341
No	5036 (99.0%)	1617 (99.4%)	1711 (99.4%)	1620 (99.1%)	
Yes	49 (1.0%)	10 (0.6%)	10 (0.6%)	14 (0.9%)	
Distance from Tax Office (km)					0.597
≤5	827 (16.3%)	246 (15.1%)	299 (17.4%)	288 (17.6%)	
>5–10	1265 (24.9%)	414 (25.4%)	426 (24.8%)	392 (24.0%)	
>10–15	718 (14.1%)	237 (14.6%)	243 (14.1%)	225 (13.8%)	
>15	2275 (44.7%)	730 (44.9%)	753 (43.8%)	729 (44.6%)	
Last Year Tax Return Filing Channel					0.765
No Report	1239 (24.4%)	379 (23.3%)	441 (25.6%)	414 (25.3%)	
Electronic	3417 (67.2%)	1124 (69.1%)	1136 (66.0%)	1082 (66.2%)	
Hardcopies	429 (8.4%)	124 (7.6%)	144 (8.4%)	138 (8.4%)	
Reported Annual Taxable Income (Rp m.)					0.828
0	3415 (67.2%)	1104 (67.9%)	1154 (67.1%)	1108 (67.8%)	
>0–50	242 (4.8%)	83 (5.1%)	86 (5.0%)	75 (4.6%)	
>50–250	703 (13.8%)	205 (12.6%)	233 (13.5%)	231 (14.1%)	
>250–500	218 (4.3%)	73 (4.5%)	70 (4.1%)	78 (4.8%)	
>500	507 (10.0%)	162 (10.0%)	178 (10.3%)	142 (8.7%)	
Annual Tax Payment (Rp m.)					0.711
0	2977 (58.5%)	984 (60.5%)	1004 (58.3%)	963 (58.9%)	
>0–2.5	940 (18.5%)	280 (17.2%)	296 (17.2%)	281 (17.2%)	
>2.5–30	877 (17.2%)	273 (16.8%)	335 (19.5%)	298 (18.2%)	
>30–62.5	140 (2.8%)	45 (2.8%)	39 (2.3%)	46 (2.8%)	
>62.5	151 (3.0%)	45 (2.8%)	47 (2.7%)	46 (2.8%)	
Total Unpaid Penalties (Rp)					0.928
0	2976 (58.5%)	969 (59.6%)	987 (57.4%)	945 (57.8%)	
>0-Avg. Monthly Pmt.	493 (9.7%)	132 (8.1%)	183 (10.6%)	170 (10.4%)	
>Avg. Monthly Pmt.	1616 (31.8%)	526 (32.3%)	551 (32.0%)	519 (31.8%)	
Audited Status					0.725
No	4980 (97.9%)	1586 (97.5%)	1685 (97.9%)	1597 (97.7%)	
Yes	105 (2.1%)	41 (2.5%)	36 (2.1%)	37 (2.3%)	

Descriptive statistics: Number of taxpayers and proportion (in parentheses). P-values indicate the results from the balance test (one-way ANOVA) for each baseline characteristic across treatment groups.

simplification, as summarised in Table 1.[7] Some words in the treatment letters appear in bold font to increase their salience to the reader (De Neve et al., 2021; Kahneman, 2012). The actual intervention letters in English and Indonesian are reproduced in Appendix 2.

3.3. Data and sample

In executing the experiment, we cooperated with 19 local tax offices within four DJP regional tax offices: South Sumatra and Bangka Belitung Islands (SSBB), Nusa Tenggara, North Jakarta, and Banten. These regional offices were selected because, as of the time of the experiment, they were the five largest issuers of STPs. The sample comprises taxpayers classed as individuals. We exclude firms as who in the firm makes payment decisions is rarely the same person that receives the letter (Castro and Scartascini, 2015). To be included in the sample, taxpayers must:

1. be an individual taxpayer registered at one of the 19 local tax offices that perform the trial;
2. be slated to be issued a STP between October 2021 and February 2022;
3. be issued penalties associated with income taxes;
4. face administrative, rather than criminal, penalties;
5. have registered an address and a telephone number with the DJP;
6. have an active payment and/or tax return filing history for the 2020 tax year.

The total number of taxpayers meeting the above criteria is $N = 11{,}026$. Of these taxpayers, 959, or around 8% of the total sample, were not ultimately served a STP and, therefore, dropped out of the sample. The reasons for such attrition are various, including where taxpayers move their registration to a local tax office not involved in the experiment. If dropping out is a random occurrence, such that the sample of dropouts is balanced across treatments, then the balance of the remaining sample is preserved. Therefore, we test the balance of the dropouts and the remaining sample across control and treatment groups (Appendix 4), finding that the balance is not compromised. Indeed, we implemented measures aimed at minimising non-random dropout, including not announcing the commencement of the experiment either to affected taxpayers or to the tax officers in charge of issuing STPs. Only the tax officers in charge of printing the intervention letters observed the allocation of taxpayers to the control and treatment groups. This gives us a final sample of 10,067 taxpayers.[8]

The outcome data consists of a de-identified list of taxpayers, their tracking status, and an indicator for timely settlement. We also collect administrative data comprising taxpayer baseline characteristics (recorded as categorical and interval variables to ensure taxpayer anonymity) which, according to the existing literature, may influence taxpayer behaviour. These include a taxpayer's age, years registered, annual income, annual tax payment, and the amount of outstanding penalties from the previous five years.[9]

3.4. Procedures

The RCT was conducted from October 2021 to February 2022, with post-trial data collection occurring in March-April 2022.

The sample of taxpayers is randomly allocated to a control and three treatment groups separately by each local tax office.[10] We perform stratified randomisation to ensure the baseline characteristics balance across control and treatment groups and to minimise the potential for selection bias. The strata are listed in the first column of Appendix 4. Following the suggestion of Bruhn and McKenzie (2009), we perform balance tests (ANOVA and Tukey-HSD) after each randomisation, repeating the process until a balanced random draw is obtained. The outcomes of this exercise are given in Table 2.

The local tax offices printed the intervention letters independently to ensure confidentiality, following DJP data regulations. We supplied customised software, printing equipment and other practical items to the local tax offices, who then implemented the trial independently. Local tax offices tracked the postage status to determine the letter delivery rate.

4. Empirical methodology

To measure the outcome, we adopt 37 days post STP issuance as the cut-off for timely settlement instead of the 30 days statutory deadline under the current regulation. As discussed in Section 3, active DJP debt recovery measures do not begin until after the elapse

[7] The design of the intervention letters in terms of format and colour mostly follows Gillitzer and Sinning (2020), but the wording is mainly adapted from the UK's Notice of Penalty Assessment form. Before deploying the intervention, we also discussed the design of each intervention letter through qualitative interviews with 11 individual taxpayers, selected based on convenient sampling.

[8] Based on a minimum detectable effect of 2%, confidence level of 5%, and targeting 80% power, with 50% of the sample allocated to a control group, an ex-ante power calculation gives the minimum required sample size as 9,800.

[9] The remaining characteristics we include are an indicator for taxpayers being monitored by a strategic business unit within the tax office; an indicator for taxpayers registered for VAT; the distance of a taxpayer's residence from the closest tax office; tax return filing channel; prior year reported annual taxable income; and an indicator for being recently audited. For further details, see Appendix 5.

[10] This is performed in each local tax office separately for practical reasons. Local tax offices could not submit a list of samples simultaneously. This approach is also employed in, e.g., Biddle et al. (2018).

Table 3
Treatment effect estimates.

Panel A – Intention to Treat (ITT)			
	(1)	(2)	(3)
Deterrence	0.037***	0.038***	0.037***
	(0.011)	(0.01)	(0.01)
Information	0.014	0.014	0.014
	(0.01)	(0.01)	(0.01)
Simplification	0.046***	0.044***	0.044***
	(0.011)	(0.011)	(0.01)
Constant	0.139***	0.139***	0.053***
	(0.005)	(0.003)	(0.015)
Test: Deterrence vs. Information	0.081	0.0591	0.0629
Test: Deterrence vs. Simplification	0.502	0.589	0.567
Test: Information vs. Simplification	0.0153	0.0262	0.0251
Strata Fixed Effect	NO	YES	YES
Tax Office Fixed Effect	NO	NO	YES
Control Group Mean	0.139	0.139	0.139
R-squared	0.003	0.003	0.059
Observations	10,067	10,067	10,067
Panel B – Local Average Treatment Effect (LATE)			
	(1)	(2)	(3)
Deterrence	0.041***	0.041***	0.041***
	(0.012)	(0.011)	(0.011)
Information	0.016	0.016	0.016
	(0.011)	(0.011)	(0.011)
Simplification	0.051***	0.050***	0.049***
	(0.012)	(0.012)	(0.011)
Constant	0.139***	0.139***	0.051***
	(0.005)	(0.003)	(0.015)
Test: Deterrence vs. Information	0.0852	0.0609	0.0654
Test: Deterrence vs. Simplification	0.48	0.567	0.547
Test: Information vs. Simplification	0.0153	0.0257	0.0248
Strata Fixed Effect	NO	YES	YES
Tax Office Fixed Effect	NO	NO	YES
Control Group Mean	0.139	0.139	0.139
R-squared	0.004	0.0035	0.0816
Observations	10,067	10,067	10,067

Outcome: Settlement within 37 days of issuance. The table reports p-values associated with the F-test for equality of treatment effects across the experimental groups (Deterrence vs. Information, Deterrence vs. Simplification, and Information vs. Simplification, respectively). Panel A reports the results from a linear probability model, while Panel B reports the results from instrumental variable regressions. There are 453 strata fixed effects and 19 tax office fixed effects. Appendix 3 (Table A1) presents the associated diagnostic test for weak instruments. Robust standard errors clustered by strata are given in parentheses. $*p < 0.1$, $**p < 0.05$, and $***p < 0.01$.

of 37 days. Indeed, the allowance of a 7-day grace period is a legal obligation on the DJP. Qualitatively identical results (not reported for brevity) are obtained when taking the cut-off to be 30 days.[11] As well as having the option of paying their penalty in full, taxpayers can also opt to pay their penalty in instalments. Taxpayers who arrange within the 37 days to pay their penalty in instalments fall within our definition of timely settlement. This point does not bear discernibly on our findings, however, for fewer than 1% of our sample arrange to pay by instalments.

4.1. Treatment effect estimation

To estimate the causal impact of each intervention, we use the following regression model for a taxpayer i in strata s with local tax office t:

$$Y_{ist} = \alpha + \beta_1 DT_i + \beta_2 IN_i + \beta_3 SM_i + \tau_s + \tau_t + \varepsilon_{is},$$

where Y_{ist} is an indicator variable for settling penalties within 37 days of the issue date; DT_i, IN_i, SM_i are indicators for treatment assignment to deterrence, information, and simplification; τ_s denotes a strata fixed effect; τ_t captures a tax office fixed effect; and ε_{is} is a random error, clustered by strata.[12]

A small proportion of taxpayers who were issued a STP did not receive the treatment due to delivery problems (556 taxpayers, representing 5.6% of the total sample). To account for this, we estimate the treatment effects using intention to treat (ITT) and local average treatment effect (LATE) analyses. ITT estimates treatment effects for all taxpayers in the sample who were issued a STP, regardless of whether they received it. Taxpayers issued a treatment letter who fail to receive the letter are handled equivalently to taxpayers who receive it but do not respond. By contrast, LATE estimates the treatment effect for taxpayers who receive the intervention letter only.

To evaluate the results of our primary analysis, we also perform a series of robustness checks to assess possible treatment effect heterogeneity across subgroups. We test the effect of our treatments when distinguishing taxpayers by region, by late filers versus late payers, and by employment status.

5. Results and discussion

Our data comprises 11,643 penalties issued to 10,067 taxpayers across 19 local tax offices in four regions. The average value of the penalties issued to the control and treatment groups ranges from Rp139,000 to slightly above Rp147,000. Around half of the penalty amounts lie between Rp50,000 and Rp100,000.

5.1. Main analysis

As described in the empirical methodology section, we estimate the separate ITT and LATE estimates of the treatment effects.

5.1.1. Treatment effect of all individuals – intention to treat

The ITT considers the initial random treatment assignment, regardless of treatment receipt. We estimate the ITT with a linear probability model.[13] Panel A of Table 3 presents the results of our ITT estimation: column 1 presents the results from the basic model; column 2 adds strata fixed effects; and column 3, our preferred specification, further includes a tax office fixed effect.

We observe that conveying behaviourally informed messages to taxpayers increases timely penalty settlement. All three regression models presented in Table 3, panel A, indicate that the simplification and deterrence letters have a positive and statistically significant effect on the prompt penalty settlement at the 1% confidence level. The point estimate for the information letter is also positive but is not significant at the 10% confidence level.

On average, individuals in the control group have a 13.9% probability of settling the STP within 37 days. Attaching the simplification letter to the standard STP yields an increase in the probability of settlement of 4.4 pp., implying a 32% increase relative to the control group. Attaching the deterrence letter induces a 3.7 pp. higher than the control group, which equals a 27% increase in the probability of timely settlement compared to the control group. Finally, the information letter induces a 1.4 pp. increase in timely penalty settlement, which equates to a 10% increase over the control group.

A comparison between treatment groups reveals that the simplification ($p<0.03$) and deterrence ($p<0.07$) letters both induced a stronger effect than did the information letter. Although the simplification letter attained the highest point estimate for the increase in the probability of settlement, the effects of the simplification and deterrence letters are indistinguishable statistically at conventional significance levels.

The critical feature of the simplification letter – the most effective treatment in point estimate terms – is providing billing codes that

[11] Use of the 37-day cut-off also has the advantage of mitigating issues relating to the lag between a STP being issued, and it being received by the taxpayer (tax offices require approximately three to five working days from the issue date to perform clerical work such as signing the STP and handing it over to the postal service).

[12] A description of the characteristics included in the randomisation process and their coding is presented in Appendix 5. We also replicate the analysis controlling for individual characteristics, instead of strata fixed effects, and obtain similar results.

[13] Similar results are obtained with probit analysis (see Appendix 3, Table A3).

Table 4
Breakdown of treatment effects.

Panel A	Deterrence	Information	Simplification
Java	0.0252**	0.0169	0.0244**
	(0.0122)	(0.0121)	(0.0122)
Outside Java	0.0601***	0.00943	0.0830***
	(0.0166)	(0.0173)	(0.0183)
Panel B	**Deterrence**	**Information**	**Simplification**
Nusa Tenggara (least developed)	0.0816***	0.0177	0.123***
	(0.0304)	(0.0289)	(0.0324)
SSBB	0.0462***	0.00410	0.0560***
	(0.0171)	(0.0185)	(0.0200)
Banten	0.0356**	0.0308**	0.0484***
	(0.0154)	(0.0154)	(0.0151)
Jakarta (most developed)	0.00721	−0.00714	−0.0175
	(0.0220)	(0.0208)	(0.0209)
Panel C	**Deterrence**	**Information**	**Simplification**
Late Payment Only	0.0260	0.0635	0.00348
	(0.0530)	(0.0460)	(0.0428)
Late Filing Only	0.0295***	0.00853	0.0431***
	(0.0111)	(0.0116)	(0.0119)
Late Payment & Filing	0.0564***	0.0180	0.0551**
	(0.0217)	(0.0217)	(0.0221)
Panel D	**Deterrence**	**Information**	**Simplification**
Employee	0.0378***	0.0109	0.0307**
	(0.0129)	(0.0125)	(0.0139)
Self-Employed	0.0357**	0.0186	0.0596***
	(0.0155)	(0.0144)	(0.0152)

Notes: Table presents treatment effects implied by the interaction model presented in Appendix 3 (Table A2). Outcome variable is settlement within 37 days of issuance. Panel A presents the interactions between the treatment and the indicator for Java; and Panel B captures the interactions of four regions. Panel C explores the interactions of penalty type, and finally Panel D captures the interactions of employee status. $^{*}p < 0.1$, $^{**}p < 0.05$, and $^{***}p < 0.01$.

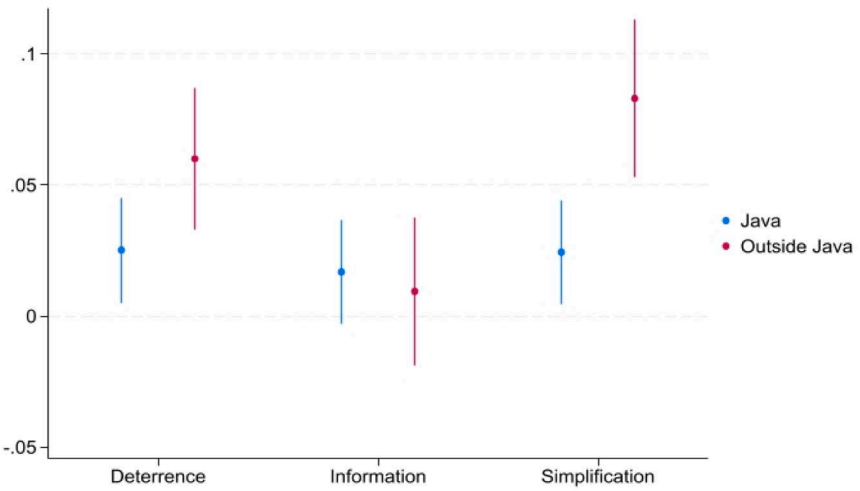


Fig. 1. Treatment effects (by Java and outside Java).

taxpayers can use directly in paying their penalty, similar to letters in Biddle et al. (2018) and De Neve (2021). Although direct comparison with the prior literature requires caution, the effect size of 4.5 seems contextually large. For instance, a simplification letter in the prior RCT of Persian et al. (2023) – also conducted in Indonesia but on the universe of all income tax filers – produced an increase

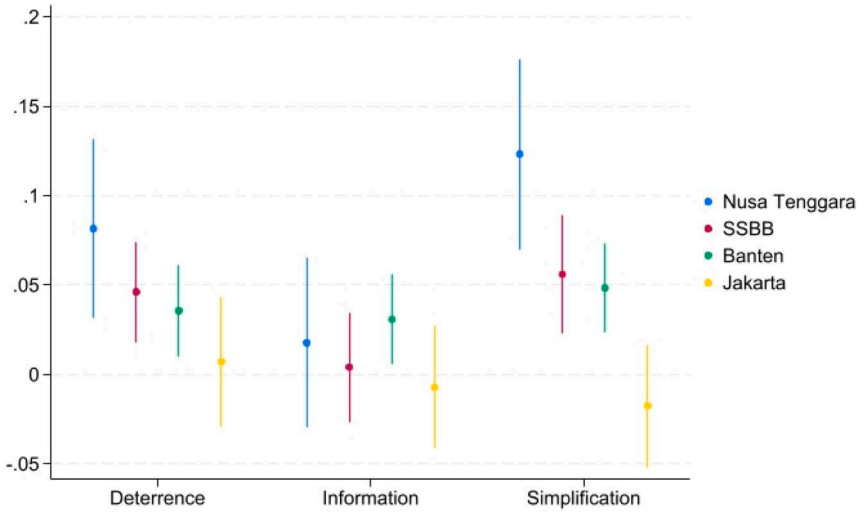


Fig. 2. Treatment effects (by region).

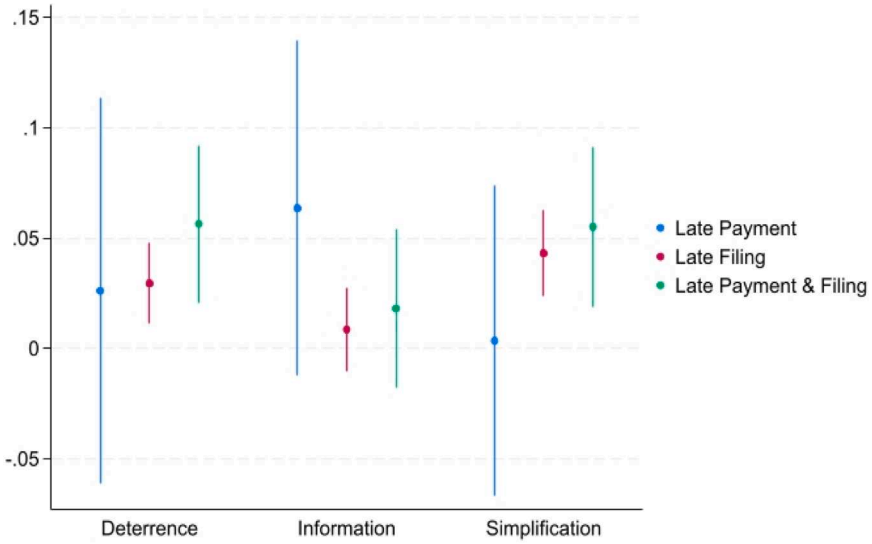


Fig. 3. Treatment effects (by penalty type).

of 0.8 pp. compared to no email in the likelihood of filing a tax return. It is perhaps also worth noting that, although it produced the smallest effect of our intervention letters, the effect of the information treatment is nevertheless stronger (1.4 pp. compared to 1.0 pp.) than for the related information treatment in Persian et al. (2023).

When turning to the deterrence treatment, our findings are consistent with recent literature in a developed country context, albeit the effect size of 3.7 pp. is somewhat larger. For instance, Dušek et al. (2022) find that highlighting penalties to speeding offenders in Prague increases speeding ticket payment rates by 2.0 pp. Also, Cranor et al. (2020) find that providing detailed penalty information increases the repayment rate of delinquent taxpayers in Colorado by around 1.5 pp.

5.1.2. Treatment effect amongst compliers – local average treatment effect

LATE computes treatment effects only for taxpayers who received the treatment. It is, therefore, expected to (and does) exceed our ITT estimates. Following, e.g., Imbens and Angrist (1994) and Gerber and Green (2012), we estimate LATE using an instrumental variable (IV) regression, the instrument being the original random allocation to treatment groups. Our LATE estimates are presented in

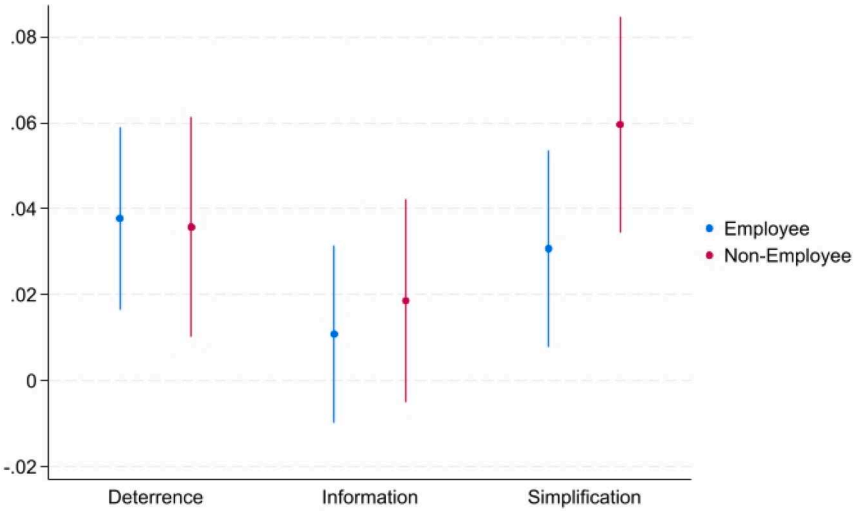


Fig. 4. Treatment effects (by employment status).

Table 3, panel B, where column 1 is for the basic model; column 2 adds strata fixed effects; and column 3 additionally includes a tax office fixed effect.[14]

According to our results (panel B, column 3), amongst taxpayers who received the treatment, the simplification letter produced the greatest effect on timely penalty settlement, increasing the probability of prompt penalty payment by 4.9 pp., equivalent to a 35% increase relative to the control group. This effect is followed in magnitude by the deterrence letter, which increased the probability of prompt settlement by 4.1 pp. (an increase of 29%). The information letter increased the probability of timely settlement by 1.6 pp. (an increase of 12%). Again, we can distinguish between the effect of the information letter relative to the other two treatments at the 5% level, but we cannot distinguish statistically between the effects of the simplification and deterrence letters.

5.2. Robustness checks

We explore the robustness of our results by performing treatment effect heterogeneity analysis across several dimensions, namely across region; employed and self-employed taxpayers; and across late filers, late payers, and those taxpayers who both file late and pay late.[15] In order to explore differences across these dimensions we interact these variables with the treatment indicators.[16] Formally this is captured by the following regression model (for a taxpayer i in strata s and local tax office t) :

$$Y_{ist} = \alpha + \beta_1 DT_i + \beta_2 IN_i + \beta_3 SM_i + \beta_4 X_i + \beta_5 DT_i.X_i + \beta_6 IN_i.X_i + \beta_7 SM_i.X_i + \tau_s + \tau_t + \varepsilon_{is},$$

where Y_{ist} is an indicator variable for settling penalties within 37 days of the issue date; DT_i, IN_i, SM_i are indicators for treatment assignment to deterrence, information, and simplification; and X_i is the dimension of heterogeneity to be explored. The term τ_s denotes a strata fixed effect; τ_t captures a tax office fixed effect; and ε_{is} is a random error, clustered by strata. In the subsequent discussion we focus on the treatment effects presented in Table 4. To aid the interpretation of these results, Figs. 1–4 present these treatment effects graphically.

Initially we explore possible regional heterogeneity. In the Indonesian context, the starkest regional differences arise between the island of Java – home to Jakarta, the capital city – and the remaining (less developed) islands. These regional disparities might be informative regarding the potential mediating effect of the level of economic development. We would expect our findings for Java to approximate results in developed country contexts, whereas results outside of Java might be considered a "purer" indication of effects in less developed environments. As presented in Panel A of Table 4, our analysis initially isolates Java from the remaining areas, while in Panel B we further explore four distinct regions.

Panel A of Table 4, and Fig. 1, suggests that – although deterrence and simplification maintain a positive and statistically significant impact in both in and outside of Java – the magnitude of the effect appears to be larger outside Java. For example, the simplification letter increases the probability of settlement by 8.3 pp. outside Java, compared to 2.4 pp. in Java, and these effects are statistically different at conventional levels. The deterrence intervention also increases the probability of timely settlement by 6.0 pp. outside Java and only 2.5 pp. in Java, albeit we cannot reject the null hypothesis of no difference between these effects.

[14] A diagnostic test for weak instruments is presented in Appendix 3 (Table A1). We reject the null hypothesis of weak instruments across all specifications.

[15] Appendix 5 presents descriptive statistics of the baseline characteristics across these dimensions.

[16] In this section we report ITT estimates only, given the similarity of the ITT and the LATE in the baseline analysis.

Table 5
Cost-benefit analysis (US $).

	(1) Control	(2) Deterrence	(3) Information	(4) Simplification
Number of taxpayers	10,067	10,067	10,067	10,067
Prompt payment (%)	13.9	17.6	15.3	18.3
Amount of timely payments	1,400	1,770	1,540	1,840
Average value of STP[1]	6.5	6.5	6.5	6.5
Total revenue	9,100	11,500	10,000	11,950
Direct benefit[2]		2,400	900	2,850
Direct benefit/taxpayer		1.4	0.6	1.6
+ reduction in warning letters[3]		0.7	0.7	0.7
Total benefit		2.1	1.3	2.3
- Cost of intervention[4]		0.2	0.2	0.2
Net benefit per taxpayer		1.9	1.1	2.1
Benefit-cost ratio		**9.5:1**	**5.5:1**	**10.5:1**

[1] Based on the late-filing penalty for individual taxpayers of Rp100,000 ($6.50).
[2] Difference between treatment and control, e.g., (2) – (1) or (3) – (1).
[3] Consists of the cost of printing and postage of warning letter.
[4] Consists of the cost of printing the intervention letter only; no additional delivery cost is required as the tax office must send an STP regardless of the intervention.
[5] $1 = Rp15,500.

Consistent with these findings would be the notion that, in areas with lower levels of formal education, understanding how to pay a penalty is a more prevalent barrier to timely settlement. To explore this idea further, we decompose the data into the four regions that participated in the RCT: Banten, Jakarta, Nusa Tenggara, and SSBB. This allows us to explore whether significant differences exist in the treatment effects between regions outside of Jakarta. Fig. 2 and panel B of Table 4 present the treatment effects for the four regions ordered by their level of development, least developed to most developed, as measured by the UN's Human Development Index (HDI) methodology. Our findings further support the idea that the treatment effects – especially of the simplification letter – relate inversely to the level of development. Positive treatment effects for the deterrence and simplification interventions are observed only in the three least-developed regions: all interventions show no statistically significant impact in Jakarta. Within the three least-developed regions, the deterrence and simplification interventions have their largest impact in the region with the least development, Nusa Tenggara, while also generating statistically significant and positive treatment effects in SSBB and Banten. The simplification letter, for example, increases the probability of timely settlement by 12.3 pp. in Nusa Tenggara, and this effect is statistically higher than the effect in Jakarta at conventional significance levels.

A further potentially important dimension of heterogeneity is based on the type of penalty. Recall that our sample comprises of taxpayers fined for late filing only (65%); taxpayers fined for late payment of taxes associated with a filing (6%); and taxpayers fined both for late filing and for late payment (29%). While the late filing attracts a fixed penalty of Rp100,000, the penalty for late payment depends on the amount of tax owed, the extent of lateness, and the applicable penalty interest rate.[17] As presented in Fig. 3 and panel C of Table 4, the results show that, for the deterrence and simplification letters, the treatment effect point estimates increase as a monotone function of the group-average level of penalties. Thus, the lowest effect size is for late payers only, and the highest effect size is for taxpayers who both file late and pay late. While cautioning that this pattern does not meet conventional levels of statistical significance, it nonetheless suggests that these letters may be increasingly salient the higher are the stakes. Another feature visible in Fig. 3 is that heterogeneity in behavioural responses amongst the group of late payers (only) far exceeds that of the other two groups (for all interventions). As a result, none of the interventions had a statistically discernible impact on the behaviour of this taxpayer group.

The last source of heterogeneity we explore is by employment status. We interact the employment status – employees and non-employees (a DJP classification that includes, but is somewhat wider than, self-employed taxpayers) – with the different interventions. As employees commonly have their income tax withheld by their employer, they typically contact the tax office only rarely. By contrast, non-employees engage in regular income tax return filing. As presented in Fig. 4 and panel D of Table 4, the deterrence and simplification interventions maintain their positive impacts of the likelihood of settlement; however, we find no statistical difference between these groups. Both taxpayer types respond to the deterrence letter and simplification similarly.

5.3. Cost-benefit analysis

Cost-benefit analysis compares the net benefit of an intervention to its cost. A ratio of 1:1 indicates that the net benefit equals its

[17] The median penalty faced by late payers (only) in our sample is Rp11,103 (well below the fine for late filing), while those who file late and pay late face a median penalty of Rp112,408.

cost.[18] Policymakers can use this measure to compare intervention outcomes and surmise the potential net benefit from scaling-up the most gainful intervention.

We summarise the comparison of the costs and benefits of the trial in Table 5. We base our figures on the average fine of $6.50 fine per taxpayer in our sample. To calculate potential revenue under each treatment, we multiply the predicted probability of timely settlements by the sample size (10,067 taxpayers), assuming all settlements are by cash payment.[19] The total benefit per taxpayer allows for a reduction in printing and delivering warning letters, worth an estimated $0.70 per taxpayer.

The treatments result in yield-to-cost ratios (Table 5) of 21:2 for the simplification letter; 20:2 (10:1) for the deterrence letter, and 11:2 for the information letter. According to these ratios, deterrence and simplification nudges are highly cost-effective.[20] For these two nudges, the ratios achieved exceed the 8:1 ratio reported by Gould and Rablen (2020) for traditional audit-based enforcement programs in the UK. Also, the benefit-to-cost ratio for deterrence is higher than the equivalent ratio of a little under 4:1 that Sinning and Zhang (2023) report in their experiment on speeding ticket compliance in Australia.

6. Concluding remarks and policy recommendations

We study the effect of behavioural nudges amongst more than 10,000 taxpayers issued tax penalties. We perform the study in Indonesia where – as we anticipate is the case in many developing countries – extant levels of timely penalty settlement are low. In this context, we provide novel evidence of the effect of deterrence and non-deterrence (information and simplification) letters on the timely settlement of tax penalties.

Economic theory has long emphasised the important role of deterrence and its effective communication. And, like many prior studies, we indeed observe that communicating deterrence improves settlement rates. Perhaps more surprising, albeit in line with recent evidence, is that – although the effects of the simplification letter are difficult to distinguish statistically from those of the deterrence letter – the balance of evidence points to simplification being the most effective of the intervention letters. Moreover, it appears that these interventions are particularly impactful in those least developed areas, highlighting a potential low-cost way to promote payment settlement in these areas.

The information letter did not increase timely payment at conventional levels of statistical significance. As information letters have proved highly effective in some other contexts, however, we echo the observation (e.g., Luttmer and Singhal, 2014; Sunstein, 2017; Dušek et al., 2022) that a central question for the nudge literature going forward must be to develop a coherent understanding of why nudges work in some contexts but fail in others. Dušek et al. (2022) interpret nudges as inducing an updating of prior beliefs. Nudges work when belief updating occurs in the desired direction and to a sufficient degree.

If Dušek et al. (2022) are right, the belief updating induced by a nudge will be a function of both the characteristics of the nudge and the characteristics of the initial environment into which it is introduced. Qualitative interviews we conducted before data collection highlighted extant weaknesses relating to the clarity of the STP, with respondents reporting confusion about how they were supposed to react to it. Thus, the strong findings we report for simplification may partly owe to the weakness of the initial conditions in which the nudge was applied.

The results of this study have policy implications. The collection of tax penalties is an important function for tax authorities worldwide, making of value any low-cost intervention capable of boosting timely payment. Based on our cost-benefit analysis, were the DJP to send 100,000 simplification letters, this would generate a net benefit of approximately Rp3.7 billion (relative to only sending the standard notification of tax penalties). These results suggest that tax authorities should engage actively with behavioural scientists to redesign many existing forms used for taxpayer communication.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Eko Arief Yogama reports financial support was provided by Indonesia Endowment Fund for Education (LPDP). Eko Arief Yogama reports a relationship with Directorate General of Taxes (DJP), Ministry of Finance of the Republic of Indonesia that includes: employment. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

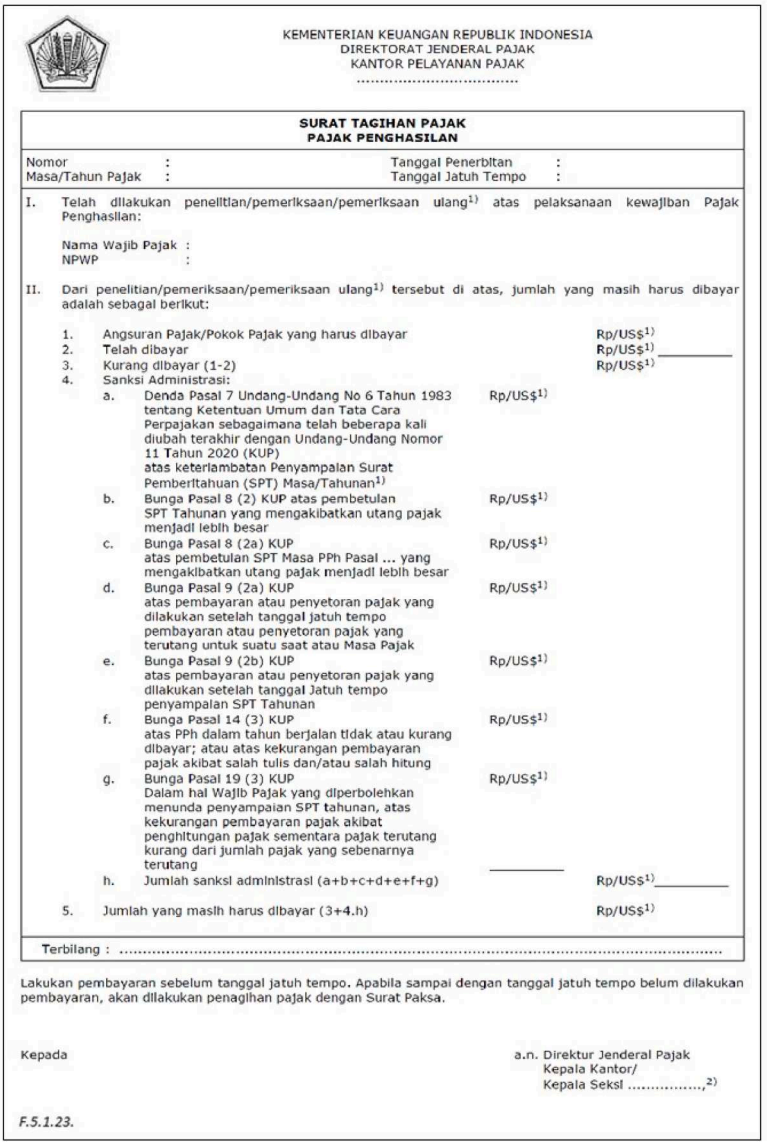
[18] Net benefit is the benefit of sending the intervention letter (including additional revenue and reduction of cost of performing heightened collection efforts) after accounting for the cost of the intervention.

[19] The predicted probabilities of timely settlement are those from the ITT analysis of Section 4.

[20] As some 3.6 million individual taxpayers in Indonesia failed to submit their 2020 tax return on time (DJP, 2022), an indicative calculation based on our findings indicates that, were the sending of the simplification letter to be implemented nationally, timely fine payments would increase by around $5.75 million annually.

Appendix 1

Example of Standard STP (in Indonesian and English)



KEMENTERIAN KEUANGAN REPUBLIK INDONESIA
DIREKTORAT JENDERAL PAJAK
KANTOR PELAYANAN PAJAK
.....

SURAT TAGIHAN PAJAK
PAJAK PENGHASILAN

Nomor :
Masa/Tahun Pajak :
Tanggal Penerbitan :
Tanggal Jatuh Tempo :

I. Telah dilakukan penelitian/pemeriksaan/pemeriksaan ulang[1)] atas pelaksanaan kewajiban Pajak Penghasilan:

Nama Wajib Pajak :
NPWP :

II. Dari penelitian/pemeriksaan/pemeriksaan ulang[1)] tersebut di atas, jumlah yang masih harus dibayar adalah sebagai berikut:

1.	Angsuran Pajak/Pokok Pajak yang harus dibayar			Rp/US$[1)]
2.	Telah dibayar			Rp/US$[1)]
3.	Kurang dibayar (1-2)			Rp/US$[1)]
4.	Sanksi Administrasi:			
	a.	Denda Pasal 7 Undang-Undang No 6 Tahun 1983 tentang Ketentuan Umum dan Tata Cara Perpajakan sebagaimana telah beberapa kali diubah terakhir dengan Undang-Undang Nomor 11 Tahun 2020 (KUP) atas keterlambatan Penyampaian Surat Pemberitahuan (SPT) Masa/Tahunan[1)]	Rp/US$[1)]	
	b.	Bunga Pasal 8 (2) KUP atas pembetulan SPT Tahunan yang mengakibatkan utang pajak menjadi lebih besar	Rp/US$[1)]	
	c.	Bunga Pasal 8 (2a) KUP atas pembetulan SPT Masa PPh Pasal ... yang mengakibatkan utang pajak menjadi lebih besar	Rp/US$[1)]	
	d.	Bunga Pasal 9 (2a) KUP atas pembayaran atau penyetoran pajak yang dilakukan setelah tanggal jatuh tempo pembayaran atau penyetoran pajak yang terutang untuk suatu saat atau Masa Pajak	Rp/US$[1)]	
	e.	Bunga Pasal 9 (2b) KUP atas pembayaran atau penyetoran pajak yang dilakukan setelah tanggal Jatuh tempo penyampaian SPT Tahunan	Rp/US$[1)]	
	f.	Bunga Pasal 14 (3) KUP atas PPh dalam tahun berjalan tidak atau kurang dibayar; atau atas kekurangan pembayaran pajak akibat salah tulis dan/atau salah hitung	Rp/US$[1)]	
	g.	Bunga Pasal 19 (3) KUP Dalam hal Wajib Pajak yang diperbolehkan menunda penyampaian SPT tahunan, atas kekurangan pembayaran pajak akibat penghitungan pajak sementara pajak terutang kurang dari jumlah pajak yang sebenarnya terutang	Rp/US$[1)]	
	h.	Jumlah sanksi administrasi (a+b+c+d+e+f+g)		Rp/US$[1)]
5.	Jumlah yang masih harus dibayar (3+4.h)			Rp/US$[1)]

Terbilang : .....

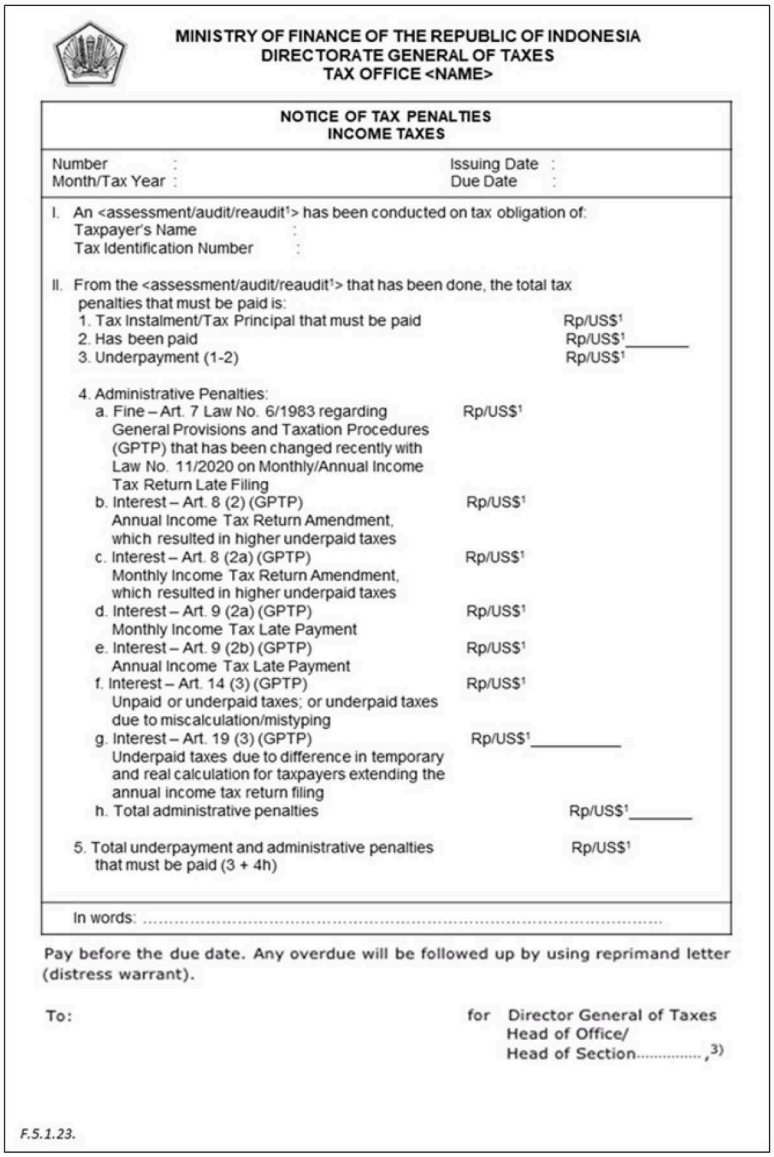
Lakukan pembayaran sebelum tanggal jatuh tempo. Apabila sampai dengan tanggal jatuh tempo belum dilakukan pembayaran, akan dilakukan penagihan pajak dengan Surat Paksa.

Kepada

a.n. Direktur Jenderal Pajak
Kepala Kantor/
Kepala Seksi .....,[2)]

F.5.1.23.

Page 1 - In Indonesian



MINISTRY OF FINANCE OF THE REPUBLIC OF INDONESIA
DIRECTORATE GENERAL OF TAXES
TAX OFFICE <NAME>

NOTICE OF TAX PENALTIES
INCOME TAXES

Number :
Month/Tax Year :
Issuing Date :
Due Date :

I. An <assessment/audit/reaudit[1]> has been conducted on tax obligation of:
Taxpayer's Name :
Tax Identification Number :

II. From the <assessment/audit/reaudit[1]> that has been done, the total tax penalties that must be paid is:

1. Tax Instalment/Tax Principal that must be paid		Rp/US$[1]
2. Has been paid		Rp/US$[1]
3. Underpayment (1-2)		Rp/US$[1]
4. Administrative Penalties:		
a. Fine – Art. 7 Law No. 6/1983 regarding General Provisions and Taxation Procedures (GPTP) that has been changed recently with Law No. 11/2020 on Monthly/Annual Income Tax Return Late Filing	Rp/US$[1]	
b. Interest – Art. 8 (2) (GPTP) Annual Income Tax Return Amendment, which resulted in higher underpaid taxes	Rp/US$[1]	
c. Interest – Art. 8 (2a) (GPTP) Monthly Income Tax Return Amendment, which resulted in higher underpaid taxes	Rp/US$[1]	
d. Interest – Art. 9 (2a) (GPTP) Monthly Income Tax Late Payment	Rp/US$[1]	
e. Interest – Art. 9 (2b) (GPTP) Annual Income Tax Late Payment	Rp/US$[1]	
f. Interest – Art. 14 (3) (GPTP) Unpaid or underpaid taxes; or underpaid taxes due to miscalculation/mistyping	Rp/US$[1]	
g. Interest – Art. 19 (3) (GPTP) Underpaid taxes due to difference in temporary and real calculation for taxpayers extending the annual income tax return filing	Rp/US$[1]	
h. Total administrative penalties		Rp/US$[1]
5. Total underpayment and administrative penalties that must be paid (3 + 4h)		Rp/US$[1]

In words: .....

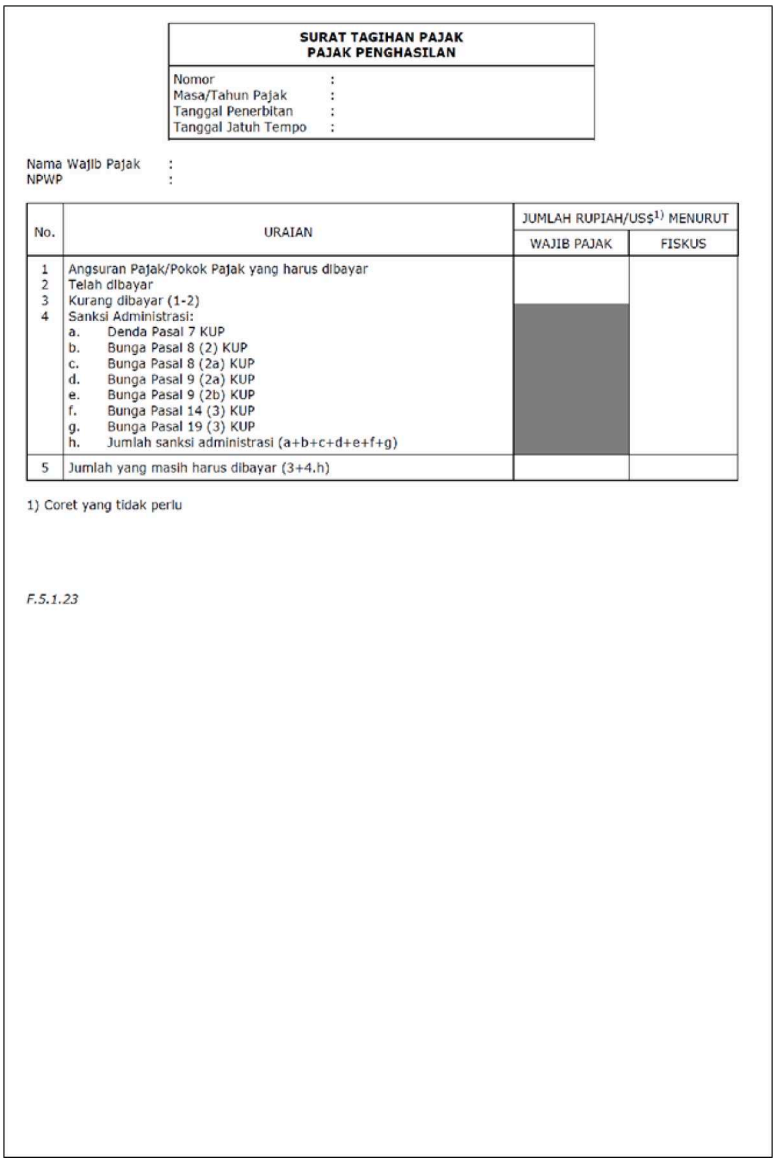
Pay before the due date. Any overdue will be followed up by using reprimand letter (distress warrant).

To:

for Director General of Taxes
Head of Office/
Head of Section....., [3)]

F.5.1.23.

Page 1 - In English



SURAT TAGIHAN PAJAK
PAJAK PENGHASILAN

Nomor :
Masa/Tahun Pajak :
Tanggal Penerbitan :
Tanggal Jatuh Tempo :

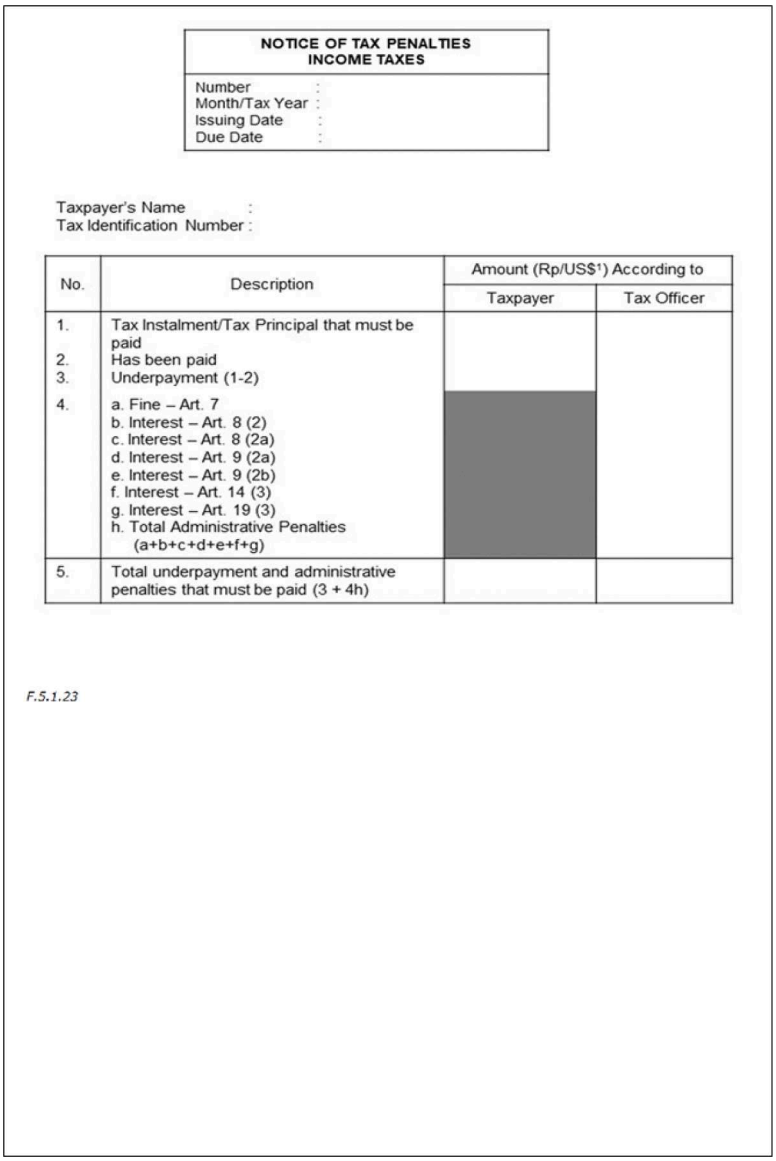
Nama Wajib Pajak :
NPWP :

No.	URAIAN	JUMLAH RUPIAH/US$[1)] MENURUT	
		WAJIB PAJAK	FISKUS
1	Angsuran Pajak/Pokok Pajak yang harus dibayar		
2	Telah dibayar		
3	Kurang dibayar (1-2)		
4	Sanksi Administrasi:		
	a. Denda Pasal 7 KUP		
	b. Bunga Pasal 8 (2) KUP		
	c. Bunga Pasal 8 (2a) KUP		
	d. Bunga Pasal 9 (2a) KUP		
	e. Bunga Pasal 9 (2b) KUP		
	f. Bunga Pasal 14 (3) KUP		
	g. Bunga Pasal 19 (3) KUP		
	h. Jumlah sanksi administrasi (a+b+c+d+e+f+g)		
5	Jumlah yang masih harus dibayar (3+4.h)		

1) Coret yang tidak perlu

F.5.1.23

Page 2 - In Indonesian



NOTICE OF TAX PENALTIES
INCOME TAXES

Number :
Month/Tax Year :
Issuing Date :
Due Date :

Taxpayer's Name :
Tax Identification Number :

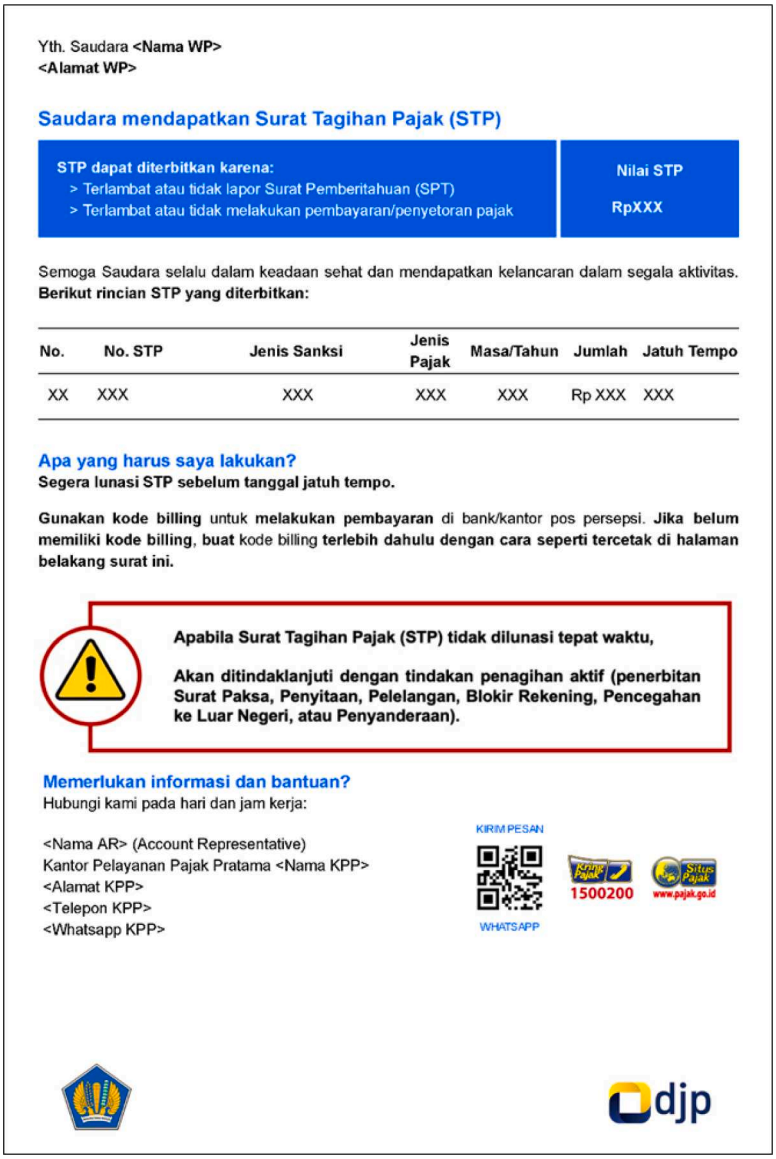
No.	Description	Amount (Rp/US$[1]) According to	
		Taxpayer	Tax Officer
1.	Tax Instalment/Tax Principal that must be paid		
2.	Has been paid		
3.	Underpayment (1-2)		
4.	a. Fine – Art. 7 b. Interest – Art. 8 (2) c. Interest – Art. 8 (2a) d. Interest – Art. 9 (2a) e. Interest – Art. 9 (2b) f. Interest – Art. 14 (3) g. Interest – Art. 19 (3) h. Total Administrative Penalties (a+b+c+d+e+f+g)		
5.	Total underpayment and administrative penalties that must be paid (3 + 4h)		

F.5.1.23

Page 2 - In English

Appendix 2

Intervention Letters (in Indonesian and English)



Yth. Saudara **<Nama WP>**
<Alamat WP>

Saudara mendapatkan Surat Tagihan Pajak (STP)

STP dapat diterbitkan karena:	**Nilai STP**
> Terlambat atau tidak lapor Surat Pemberitahuan (SPT) > Terlambat atau tidak melakukan pembayaran/penyetoran pajak	**RpXXX**

Semoga Saudara selalu dalam keadaan sehat dan mendapatkan kelancaran dalam segala aktivitas.
Berikut rincian STP yang diterbitkan:

No.	No. STP	Jenis Sanksi	Jenis Pajak	Masa/Tahun	Jumlah	Jatuh Tempo
XX	XXX	XXX	XXX	XXX	Rp XXX	XXX

Apa yang harus saya lakukan?
Segera lunasi STP sebelum tanggal jatuh tempo.

Gunakan kode billing untuk **melakukan pembayaran** di bank/kantor pos persepsi. **Jika belum memiliki kode billing, buat** kode billing **terlebih dahulu dengan cara seperti tercetak di halaman belakang surat ini.**

Apabila Surat Tagihan Pajak (STP) tidak dilunasi tepat waktu,

Akan ditindaklanjuti dengan tindakan penagihan aktif (penerbitan Surat Paksa, Penyitaan, Pelelangan, Blokir Rekening, Pencegahan ke Luar Negeri, atau Penyanderaan).

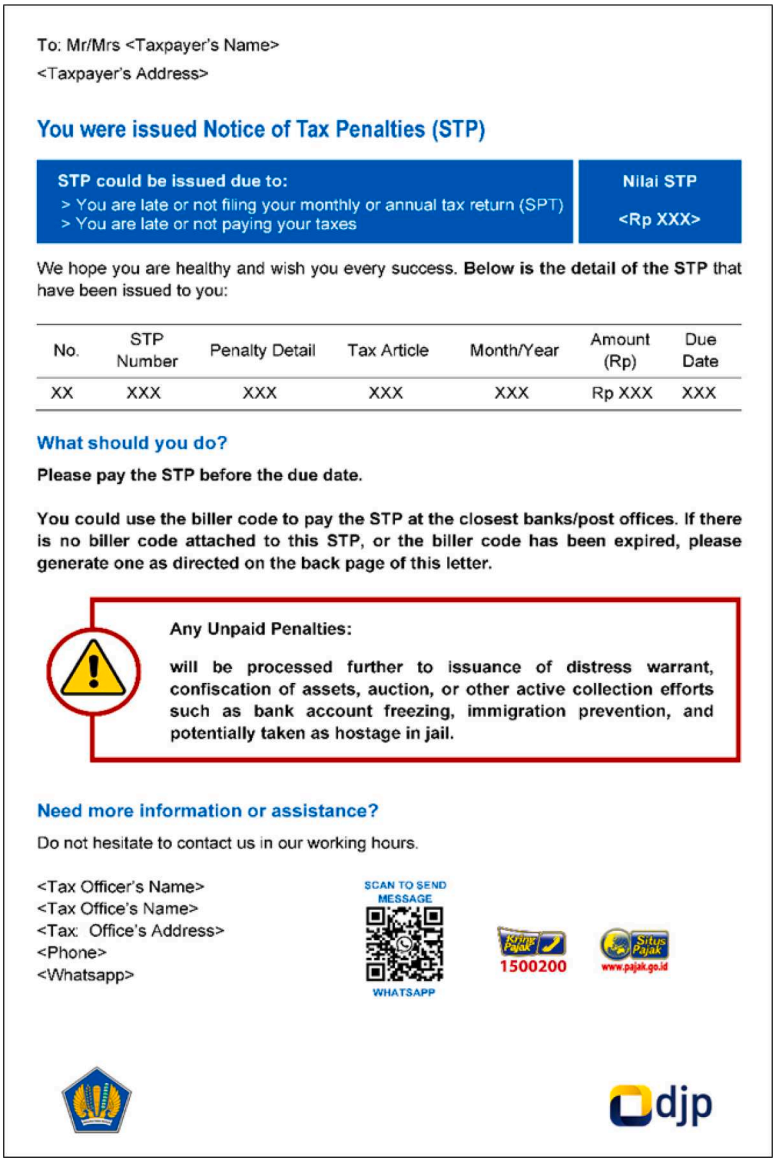
Memerlukan informasi dan bantuan?
Hubungi kami pada hari dan jam kerja:

<Nama AR> (Account Representative)
Kantor Pelayanan Pajak Pratama <Nama KPP>
<Alamat KPP>
<Telepon KPP>
<Whatsapp KPP>

KIRIM PESAN
WHATSAPP
1500200
www.pajak.go.id

djp

Deterrence - In Indonesian



To: Mr/Mrs <Taxpayer's Name>
<Taxpayer's Address>

You were issued Notice of Tax Penalties (STP)

STP could be issued due to:	Nilai STP
> You are late or not filing your monthly or annual tax return (SPT) > You are late or not paying your taxes	<Rp XXX>

We hope you are healthy and wish you every success. **Below is the detail of the STP** that have been issued to you:

No.	STP Number	Penalty Detail	Tax Article	Month/Year	Amount (Rp)	Due Date
XX	XXX	XXX	XXX	XXX	Rp XXX	XXX

What should you do?

Please pay the STP before the due date.

You could use the biller code to pay the STP at the closest banks/post offices. If there is no biller code attached to this STP, or the biller code has been expired, please generate one as directed on the back page of this letter.

Any Unpaid Penalties:

will be processed further to issuance of distress warrant, confiscation of assets, auction, or other active collection efforts such as bank account freezing, immigration prevention, and potentially taken as hostage in jail.

Need more information or assistance?

Do not hesitate to contact us in our working hours.

<Tax Officer's Name>
<Tax Office's Name>
<Tax Office's Address>
<Phone>
<Whatsapp>

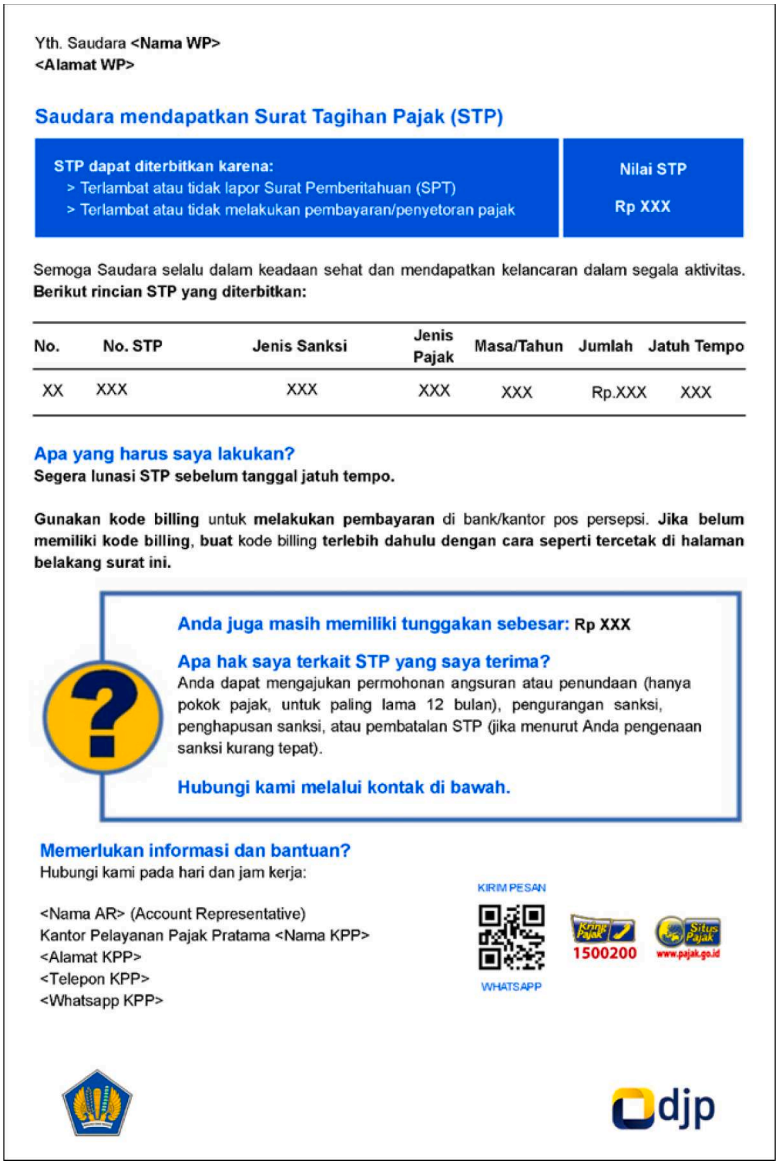
SCAN TO SEND MESSAGE
WHATSAPP

Kring Pajak 1500200

Situs Pajak www.pajak.go.id

djp

Deterrence - In English



Yth. Saudara **<Nama WP>**
<Alamat WP>

Saudara mendapatkan Surat Tagihan Pajak (STP)

STP dapat diterbitkan karena:	**Nilai STP**
> Terlambat atau tidak lapor Surat Pemberitahuan (SPT) > Terlambat atau tidak melakukan pembayaran/penyetoran pajak	**Rp XXX**

Semoga Saudara selalu dalam keadaan sehat dan mendapatkan kelancaran dalam segala aktivitas.
Berikut rincian STP yang diterbitkan:

No.	No. STP	Jenis Sanksi	Jenis Pajak	Masa/Tahun	Jumlah	Jatuh Tempo
XX	XXX	XXX	XXX	XXX	Rp.XXX	XXX

Apa yang harus saya lakukan?
Segera lunasi STP sebelum tanggal jatuh tempo.

Gunakan kode billing untuk **melakukan pembayaran** di bank/kantor pos persepsi. **Jika belum memiliki kode billing, buat** kode billing **terlebih dahulu dengan cara seperti tercetak di halaman belakang surat ini.**

Anda juga masih memiliki tunggakan sebesar: Rp XXX

Apa hak saya terkait STP yang saya terima?
Anda dapat mengajukan permohonan angsuran atau penundaan (hanya pokok pajak, untuk paling lama 12 bulan), pengurangan sanksi, penghapusan sanksi, atau pembatalan STP (jika menurut Anda pengenaan sanksi kurang tepat).

Hubungi kami melalui kontak di bawah.

Memerlukan informasi dan bantuan?
Hubungi kami pada hari dan jam kerja:

<Nama AR> (Account Representative)
Kantor Pelayanan Pajak Pratama <Nama KPP>
<Alamat KPP>
<Telepon KPP>
<Whatsapp KPP>

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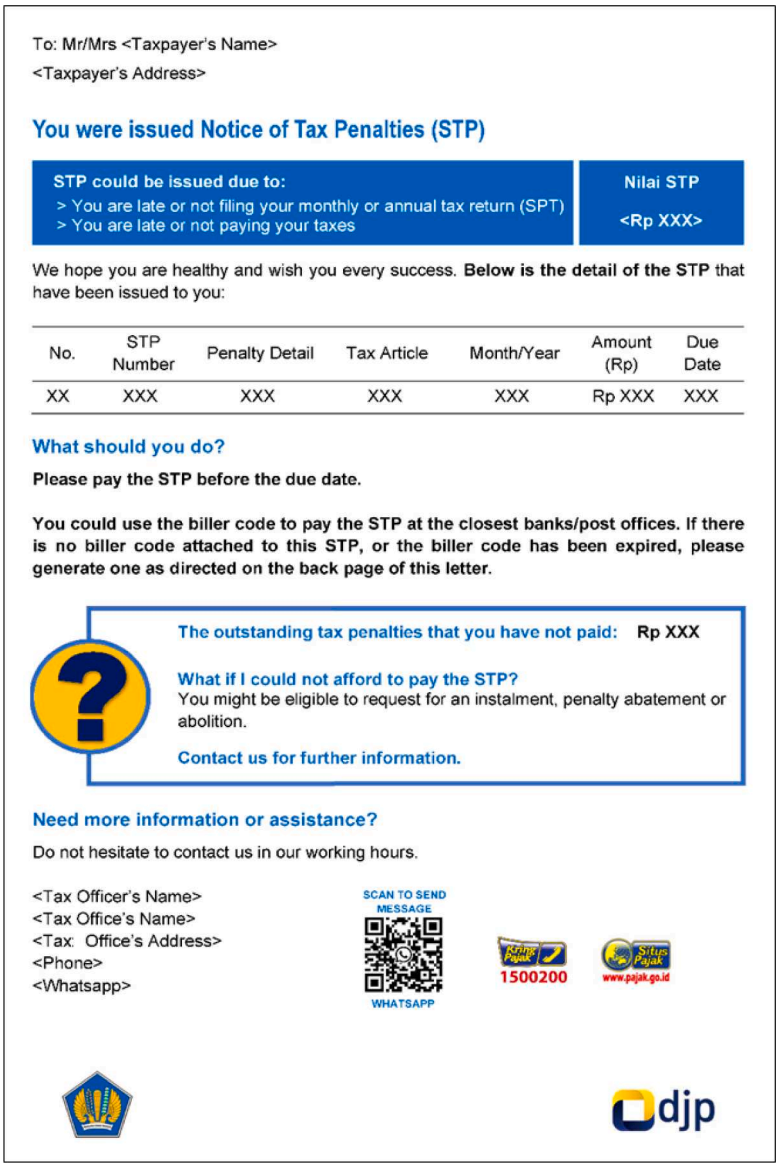
Kring Pajak 1500200
Situs Pajak www.pajak.go.id

djp

Information - In Indonesian



To: Mr/Mrs <Taxpayer's Name>
<Taxpayer's Address>

You were issued Notice of Tax Penalties (STP)

STP could be issued due to:	Nilai STP
> You are late or not filing your monthly or annual tax return (SPT) > You are late or not paying your taxes	<Rp XXX>

We hope you are healthy and wish you every success. **Below is the detail of the STP** that have been issued to you:

No.	STP Number	Penalty Detail	Tax Article	Month/Year	Amount (Rp)	Due Date
XX	XXX	XXX	XXX	XXX	Rp XXX	XXX

What should you do?

Please pay the STP before the due date.

You could use the biller code to pay the STP at the closest banks/post offices. If there is no biller code attached to this STP, or the biller code has been expired, please generate one as directed on the back page of this letter.

The outstanding tax penalties that you have not paid: Rp XXX

What if I could not afford to pay the STP?
You might be eligible to request for an instalment, penalty abatement or abolition.

Contact us for further information.

Need more information or assistance?

Do not hesitate to contact us in our working hours.

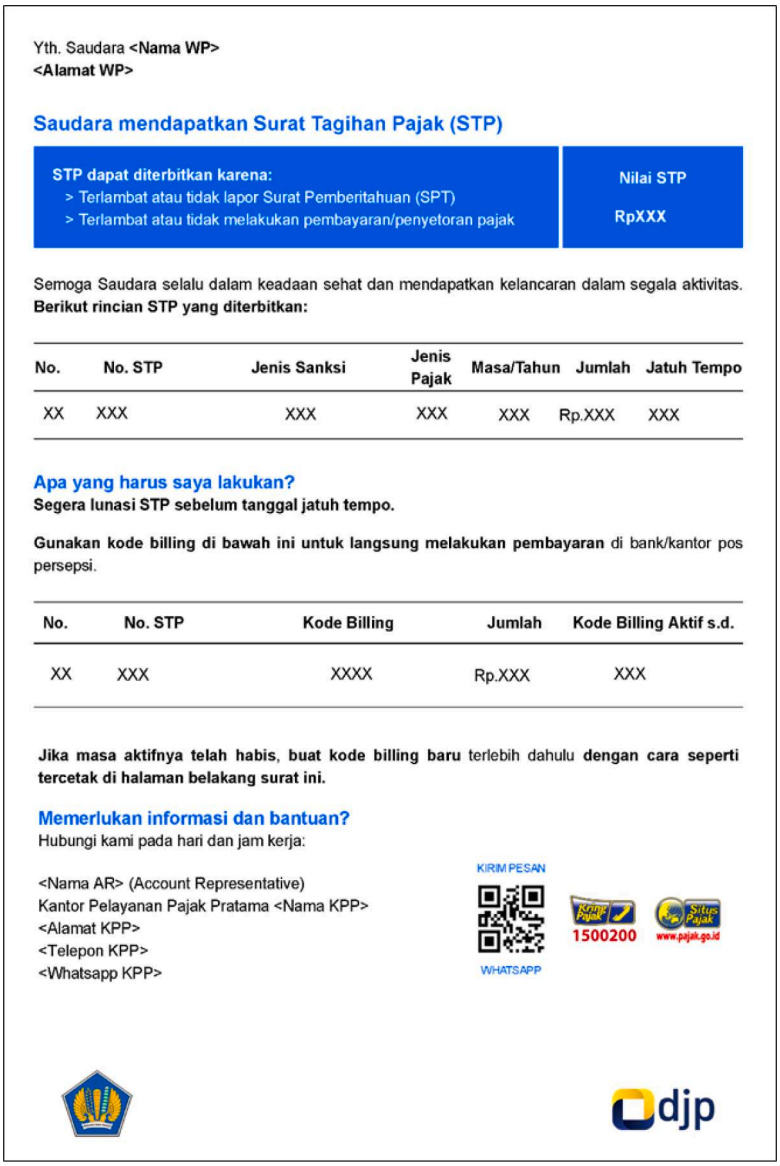
<Tax Officer's Name>
<Tax Office's Name>
<Tax: Office's Address>
<Phone>
<Whatsapp>

SCAN TO SEND MESSAGE
WHATSAPP

Kring Pajak 1500200
Situs Pajak www.pajak.go.id

djp

Information - In English



Yth. Saudara **<Nama WP>**
<Alamat WP>

Saudara mendapatkan Surat Tagihan Pajak (STP)

STP dapat diterbitkan karena:	**Nilai STP**
> Terlambat atau tidak lapor Surat Pemberitahuan (SPT) > Terlambat atau tidak melakukan pembayaran/penyetoran pajak	**RpXXX**

Semoga Saudara selalu dalam keadaan sehat dan mendapatkan kelancaran dalam segala aktivitas.
Berikut rincian STP yang diterbitkan:

No.	No. STP	Jenis Sanksi	Jenis Pajak	Masa/Tahun	Jumlah	Jatuh Tempo
XX	XXX	XXX	XXX	XXX	Rp.XXX	XXX

Apa yang harus saya lakukan?

Segera lunasi STP sebelum tanggal jatuh tempo.

Gunakan kode billing di bawah ini untuk langsung melakukan pembayaran di bank/kantor pos persepsi.

No.	No. STP	Kode Billing	Jumlah	Kode Billing Aktif s.d.
XX	XXX	XXXX	Rp.XXX	XXX

Jika masa aktifnya telah habis, buat kode billing baru terlebih dahulu **dengan cara seperti tercetak di halaman belakang surat ini.**

Memerlukan informasi dan bantuan?

Hubungi kami pada hari dan jam kerja:

<Nama AR> (Account Representative)
Kantor Pelayanan Pajak Pratama <Nama KPP>
<Alamat KPP>
<Telepon KPP>
<Whatsapp KPP>

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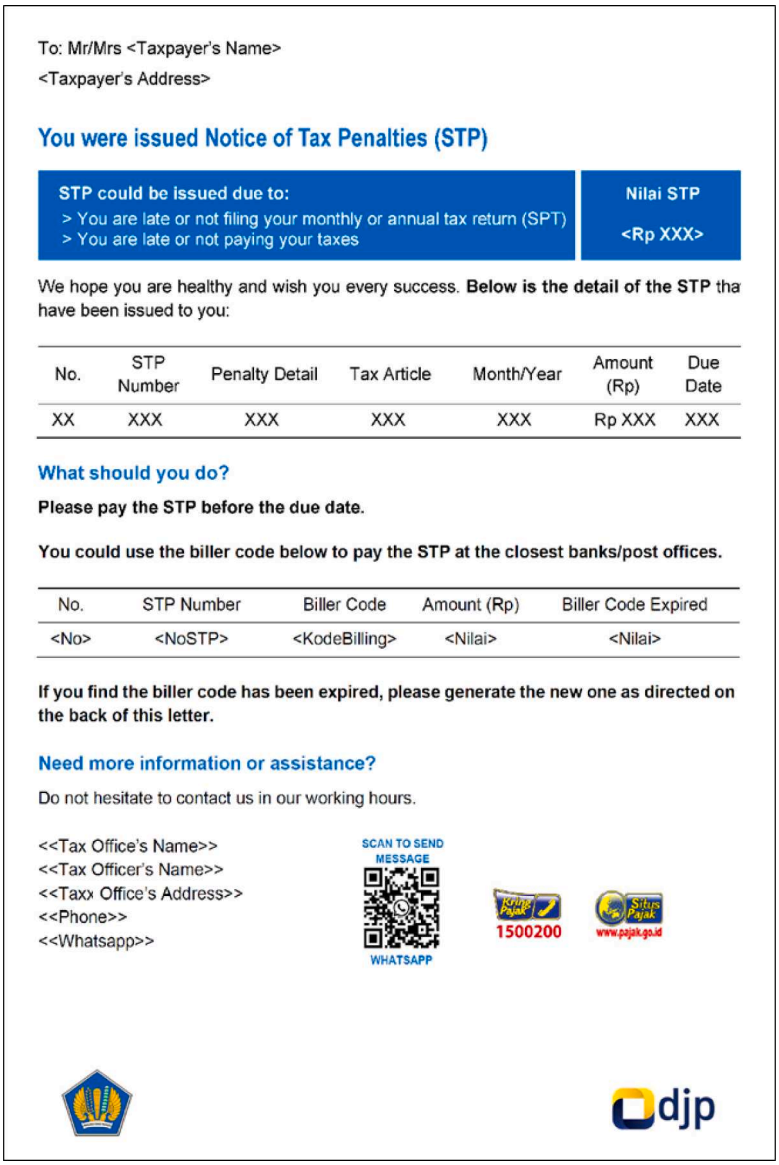
Situs Pajak www.pajak.go.id
djp

Simplification - In Indonesian



To: Mr/Mrs <Taxpayer's Name>
<Taxpayer's Address>

You were issued Notice of Tax Penalties (STP)

STP could be issued due to:	Nilai STP
> You are late or not filing your monthly or annual tax return (SPT) > You are late or not paying your taxes	<Rp XXX>

We hope you are healthy and wish you every success. **Below is the detail of the STP tha** have been issued to you:

No.	STP Number	Penalty Detail	Tax Article	Month/Year	Amount (Rp)	Due Date
XX	XXX	XXX	XXX	XXX	Rp XXX	XXX

What should you do?

Please pay the STP before the due date.

You could use the biller code below to pay the STP at the closest banks/post offices.

No.	STP Number	Biller Code	Amount (Rp)	Biller Code Expired
<No>	<NoSTP>	<KodeBilling>	<Nilai>	<Nilai>

If you find the biller code has been expired, please generate the new one as directed on the back of this letter.

Need more information or assistance?

Do not hesitate to contact us in our working hours.

<<Tax Office's Name>>
<<Tax Officer's Name>>
<<Tax› Office's Address>>
<<Phone>>
<<Whatsapp>>

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WHATSAPP

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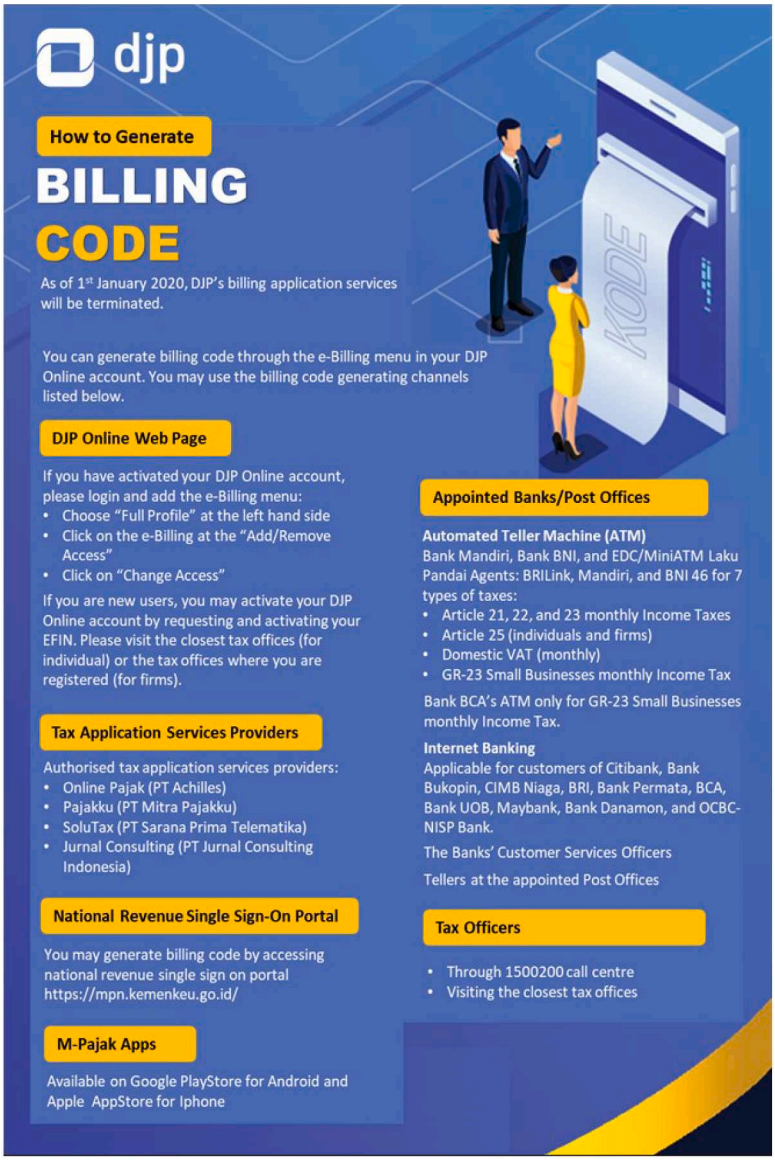
djp

Simplification - In English

Graphical Content Printed on the Back of All Intervention Letters (How to Generate Billing Code – in Indonesian and English)

In Indonesian


djp
How to Generate
BILLING
CODE
As of 1st January 2020, DJP's billing application services will be terminated.
You can generate billing code through the e-Billing menu in your DJP Online account. You may use the billing code generating channels listed below.
KODE
DJP Online Web Page
If you have activated your DJP Online account, please login and add the e-Billing menu:
• Choose "Full Profile" at the left hand side
• Click on the e-Billing at the "Add/Remove Access"
• Click on "Change Access"
If you are new users, you may activate your DJP Online account by requesting and activating your EFIN. Please visit the closest tax offices (for individual) or the tax offices where you are registered (for firms).
Tax Application Services Providers
Authorised tax application services providers:
• Online Pajak (PT Achilles)
• Pajakku (PT Mitra Pajakku)
• SoluTax (PT Sarana Prima Telematika)
• Jurnal Consulting (PT Jurnal Consulting Indonesia)
National Revenue Single Sign-On Portal
You may generate billing code by accessing national revenue single sign on portal https://mpn.kemenkeu.go.id/
M-Pajak Apps
Available on Google PlayStore for Android and Apple AppStore for Iphone
Appointed Banks/Post Offices
Automated Teller Machine (ATM)
Bank Mandiri, Bank BNI, and EDC/MiniATM Laku Pandai Agents: BRILink, Mandiri, and BNI 46 for 7 types of taxes:
• Article 21, 22, and 23 monthly Income Taxes
• Article 25 (individuals and firms)
• Domestic VAT (monthly)
• GR-23 Small Businesses monthly Income Tax
Bank BCA's ATM only for GR-23 Small Businesses monthly Income Tax.
Internet Banking
Applicable for customers of Citibank, Bank Bukopin, CIMB Niaga, BRI, Bank Permata, BCA, Bank UOB, Maybank, Bank Danamon, and OCBC-NISP Bank.
The Banks' Customer Services Officers
Tellers at the appointed Post Offices
Tax Officers
• Through 1500200 call centre
• Visiting the closest tax offices

In English

Appendix 3

Table A1
F-Statistics for the first-stage regression – LATE.

	(1)	(2)	(3)
Deterrence	27,918	2566	799
	(0.0000)	(0.000)	(0.000)
Information	24,250	2635	730
	(0.000)	(0.0000)	(0.0000)
Simplification	25,121	1832	486
	(0.0000)	(0.0000)	(0.0000)
Kleibergen-Paap F statistic	3059.1	3021.3	2988.9

Notes: Table presents the first stage F-statistics for panel B of Table 3. It also presents the Kleibergen-Paap F-statistic for weak instrument detection with multiple endogenous variables. p-values are in parentheses.

Table A2
Interaction results – coefficients.

	(1) Java	(2) Region	(3) Penalty Type	(4) Employee Status
Deterrence	0.025**	0.0816***	0.026	0.038***
	(0.012)	(0.0304)	(0.053)	(0.013)
Information	0.017	0.0177	0.064	0.011
	(0.012)	(0.0289)	(0.046)	(0.013)
Simplification	0.024**	0.123***	0.003	0.031**
	(0.012)	(0.0324)	(0.043)	(0.014)
Outside Java	0.041**			
	(0.0183)			
Deterrence × Outside Java	0.035*			
	(0.021)			
Information × Outside Java	−0.007			
	(0.021)			
Simplification × Outside Java	0.059***			
	(0.022)			
SSBB		−0.00701		
		(0.0315)		
Banten		−0.0634**		
		(0.0307)		
Jakarta (most developed)		0.0514		
		(0.0336)		
Deterrence × SSBB		−0.0354		
		(0.0335)		
Deterrence × Banten		−0.0460		
		(0.0344)		
Deterrence × Jakarta		−0.0743**		
		(0.0375)		
Information × SSBB		−0.0136		
		(0.0320)		
Information × Banten		0.0131		
		(0.0341)		
Information × Jakarta		−0.0248		
		(0.0358)		
Simplification × SSBB		−0.0673*		
		(0.0370)		
Simplification × Banten		−0.0749**		
		(0.0360)		
Simplification × Jakarta		−0.141***		
		(0.0382)		
Late Filing Only			−0.1235***	
			(0.0279)	
Late Payment & Filing			−0.0441*	
			(0.0261)	

(*continued on next page*)

Table A2 (*continued*)

	(1) Java	(2) Region	(3) Penalty Type	(4) Employee Status
Deterrence × Late Filing Only			0.003	
			(0.055)	
Deterrence × Late Payment & Filing			0.030	
			(0.057)	
Information × Late Filing Only			−0.055	
			(0.048)	
Information × Late Payment & Filing			−0.045	
			(0.051)	
Simplification × Late Filing Only			0.040	
			(0.044)	
Simplification × Late Payment & Filing			0.052	
			(0.049)	
Non-Employee				−0.036***
				(0.0126)
Deterrence × Non-Employee				−0.002
				(0.020)
Information × Non-Employee				0.008
				(0.018)
Simplification × Non-Employee				0.029
				(0.021)
Strata Fixed Effects	Yes	Yes	Yes	Yes
Tax Office Fixed Effects	Yes	Yes	Yes	Yes
R-squared	0.060	0.061	0.066	0.060
Observations	10,067	10,067	10,067	10,067

Outcome: Settlement within 37 days of issuance. Column 1 presents the interactions between the treatments and the indicator for Java; Column 2 captures the effects across the four regions. Column 3 explores the interactions of penalty type and column 4 captures employee status. All models are estimated using a linear probability model. Robust standard errors clustered by strata are given in parentheses. $*p < 0.1$, $**p < 0.05$, and $***p < 0.01$.

Table A3
ITT estimates (Probit model).

	(1)	(2)	(3)
Deterrence	0.153***	0.174***	0.176***
	(0.043)	(0.045)	(0.046)
Information	0.063	0.068	0.066
	(0.043)	(0.045)	(0.046)
Simplification	0.188***	0.200***	0.206***
	(0.042)	(0.044)	(0.045)
Constant	−1.085***	−1.321***	−1.734***
	(0.022)	(0.277)	(0.322)
Deterrence vs. Information	0.0807	0.0513	0.0510
Deterrence vs. Simplification	0.502	0.624	0.590
Information vs. Simplification	0.0152	0.0135	0.0118
Tax Office Fixed Effect	NO	NO	YES
Strata Fixed Effect	NO	YES	YES
Control Group Mean	0.139	0.123	0.109
R-squared	0.003	0.07	0.132
Observations	10,067	9816	9816
Number of Strata	453	453	453
Number of Tax Offices	19	19	19

Outcome: An indicator for STP settlement within 37 days of issuance. The table reports p-values associated with the Chi-square test for equality of treatment effects across the experimental groups (Deterrence vs. Information, Deterrence vs. Simplification, and Information vs. Simplification, respectively). Units are in pp. Robust standard errors clustered by strata are given in parentheses. $*p < 0.1$, $**p < 0.05$, and $***p < 0.01$.

Appendix 4

Descriptive Statistics and Balance Test (ANOVA) of Dropout Taxpayers

	Control ($N = 473$)	Deterrence ($N = 156$)	Information ($N = 175$)	Simplification ($N = 155$)	p-value
Age of Taxpayer (years)					0.955
<20	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
20–29	38 (8.0%)	12 (7.7%)	12 (6.9%)	9 (5.8%)	
30–39	95 (20.1%)	28 (17.9%)	46 (26.3%)	36 (23.2%)	
40–49	131 (27.7%)	52 (33.3%)	41 (23.4%)	43 (27.7%)	
>50	209 (44.2%)	64 (41.0%)	76 (43.4%)	67 (43.2%)	
Years Registered					0.705
≤2	62 (13.1%)	22 (14.1%)	24 (13.7%)	16 (10.3%)	
>2–5	51 (10.8%)	21 (13.5%)	22 (12.6%)	21 (13.5%)	
>5–7	38 (8.0%)	14 (9.0%)	12 (6.9%)	10 (6.5%)	
>7	322 (68.1%)	99 (63.5%)	117 (66.9%)	108 (69.7%)	
Occupation					0.686
Employee	187 (39.5%)	54 (34.6%)	65 (37.1%)	62 (40.0%)	
Non-employee	286 (60.5%)	102 (65.4%)	110 (62.9%)	93 (60.0%)	
Strategic Taxpayer Status					0.796
No	463 (97.9%)	153 (98.1%)	172 (98.3%)	150 (96.8%)	
Yes	10 (2.1%)	3 (1.9%)	3 (1.7%)	5 (3.2%)	
VAT Taxpayer Status					0.643
No	460 (97.3%)	150 (96.2%)	168 (96.0%)	152 (98.1%)	
Yes	13 (2.7%)	6 (3.8%)	7 (4.0%)	3 (1.9%)	
Distance from Tax Office (km)					0.372
≤5	76 (16.1%)	18 (11.5%)	21 (12.0%)	20 (12.9%)	
>5–10	181 (38.3%)	58 (37.2%)	62 (35.4%)	54 (34.8%)	
>10–15	54 (11.4%)	24 (15.4%)	28 (16.0%)	24 (15.5%)	
>15	162 (34.2%)	56 (35.9%)	64 (36.6%)	57 (36.8%)	
Prior Year Tax Return Filing Channel					0.869
No Report	67 (14.2%)	23 (14.7%)	25 (14.3%)	19 (12.3%)	
Electronic	330 (69.8%)	108 (69.2%)	115 (65.7%)	113 (72.9%)	
Hardcopies	76 (16.1%)	25 (16.0%)	35 (20.0%)	23 (14.8%)	
Reported Annual Taxable Income (Rp m.)					0.693
0	286 (60.5%)	95 (60.9%)	103 (58.9%)	87 (56.1%)	
>0–50	65 (13.7%)	21 (13.5%)	27 (15.4%)	20 (12.9%)	
>50–250	63 (13.3%)	16 (10.3%)	20 (11.4%)	23 (14.8%)	
>250–500	20 (4.2%)	8 (5.1%)	10 (5.7%)	10 (6.5%)	
>500	39 (8.2%)	16 (10.3%)	15 (8.6%)	15 (9.7%)	
Annual Tax Payment (Rp m.)					0.627
0	148 (31.3%)	47 (30.1%)	61 (34.9%)	55 (35.5%)	
>0–2.5	174 (36.8%)	56 (35.9%)	64 (36.6%)	44 (28.4%)	
>2.5–30	116 (24.5%)	36 (23.1%)	35 (20.0%)	47 (30.3%)	
>30–62.5	8 (1.7%)	7 (4.5%)	7 (4.0%)	5 (3.2%)	
>62.5	27 (5.7%)	10 (6.4%)	8 (4.6%)	4 (2.6%)	
Total Unpaid STPs (Rp)					0.464
0	294 (62.2%)	102 (65.4%)	101 (57.7%)	97 (62.6%)	
>0-Avg. Monthly Pmt.	65 (13.7%)	18 (11.5%)	23 (13.1%)	23 (14.8%)	
>Avg. Monthly Pmt.	114 (24.1%)	36 (23.1%)	51 (29.1%)	35 (22.6%)	
Audited Status					0.732
No	465 (98.3%)	153 (98.1%)	170 (97.1%)	153 (98.7%)	
Yes	8 (1.7%)	3 (1.9%)	5 (2.9%)	2 (1.3%)	

Descriptive statistics: Mean and standard deviation (in parentheses). P-values indicate the results from the balance test (ANOVA) for each baseline characteristic across treatment groups.

The qualitative results above are replicated with a Tukey-HSD test. This test is more restrictive than the ANOVA test in that it requires that the characteristics of the control and treatment groups do not differ. Consistent with the findings above, an ANOVA test on the sample excluding dropouts indicates no loss of balance from dropouts.

Appendix 5

Taxpayer Characteristics Descriptive Statistics Across Heterogeneity Indicators

	Region		Types of Penalty			Employment Status	
	Java ($N = 6782$)	Outside Java ($N = 3285$)	Late Payment Only ($N = 584$)	Late Filing Only ($N = 6588$)	Late Payment & Filing ($N = 2895$)	Employee ($N = 5469$)	Non-Employee ($N = 4598$)
Age of Taxpayer (years)							
<20	67 (1.0%)	13 (0.4%)	3 (0.5%)	65 (1.0%)	12 (0.4%)	17 (0.3%)	63 (1.4%)
20–29	1016 (15.0%)	479 (14.6%)	43 (7.4%)	1220 (18.5%)	232 (8.0%)	996 (18.2%)	499 (10.9%)
30–39	1529 (22.5%)	890 (27.1%)	139 (23.8%)	1675 (25.4%)	605 (20.9%)	1552 (28.4%)	867 (18.9%)
40–49	1619 (23.9%)	808 (24.6%)	151 (25.9%)	1447 (22.0%)	829 (28.6%)	1211 (22.1%)	1216 (26.4%)
>50	2551 (37.6%)	1095 (33.3%)	248 (42.5%)	2181 (33.1%)	1217 (42.0%)	1693 (31.0%)	1953 (42.5%)
Years Registered							
≤ 2	816 (12.0%)	719 (21.9%)	37 (6.3%)	1240 (18.8%)	258 (8.9%)	553 (10.1%)	982 (21.4%)
>2–5	822 (12.1%)	859 (26.1%)	73 (12.5%)	1183 (18.0%)	425 (14.7%)	904 (16.5%)	777 (16.9%)
>5–7	554 (8.2%)	232 (7.1%)	44 (7.5%)	527 (8.0%)	215 (7.4%)	581 (10.6%)	205 (4.5%)
>7	4590 (67.7%)	1475 (44.9%)	430 (73.6%)	3638 (55.2%)	1997 (69.0%)	3431 (62.7%)	2634 (57.3%)
Occupation							
Employee	1218 (18.0%)	442 (13.5%)	203 (34.8%)	4213 (63.9%)	1053 (36.4%)	–	–
Non-employee	2140 (31.6%)	357 (10.9%)	381 (65.2%)	2375 (36.1%)	1842 (63.6%)		
Strategic Taxpayer Status							
No	1309 (19.3%)	114 (3.5%)	580 (99.3%)	6548 (99.4%)	2860 (98.8%)	5445 (99.6%)	4543 (98.8%)
Yes	2115 (31.2%)	2372 (72.2%)	4 (0.7%)	40 (0.6%)	35 (1.2%)	24 (0.4%)	55 (1.2%)
VAT Taxpayer Status							
No	3551 (52.4%)	1918 (58.4%)	572 (97.9%)	6558 (99.5%)	2854 (98.6%)	5464 (99.9%)	4520 (98.3%)
Yes	3231 (47.6%)	1367 (41.6%)	12 (2.1%)	30 (0.5%)	41 (1.4%)	5 (0.1%)	78 (1.7%)
Distance from Tax Office (km)							
≤5	6753 (99.6%)	3235 (98.5%)	105 (18.0%)	1213 (18.4%)	342 (11.8%)	880 (16.1%)	780 (17.0%)
>5–10	29 (0.4%)	50 (1.5%)	156 (26.7%)	1391 (21.1%)	950 (32.8%)	1277 (23.3%)	1220 (26.5%)
>10–15	6725 (99.2%)	3259 (99.2%)	136 (23.3%)	667 (10.1%)	620 (21.4%)	660 (12.1%)	763 (16.6%)
>15	57 (0.8%)	26 (0.8%)	187 (32.0%)	3317 (50.3%)	983 (34.0%)	2652 (48.5%)	1835 (39.9%)
Prior Year Tax Return Filing Channel							
No Report	1541 (22.7%)	932 (28.4%)	44 (7.5%)	1921 (29.2%)	508 (17.5%)	977 (17.9%)	1496 (32.5%)
Electronic	4778 (70.5%)	1981 (60.3%)	462 (79.1%)	4477 (68.0%)	1820 (62.9%)	4269 (78.1%)	2490 (54.2%)
Hardcopies	463 (6.8%)	372 (11.3%)	78 (13.4%)	190 (2.9%)	567 (19.6%)	223 (4.1%)	612 (13.3%)
Reported Annual Taxable Income (Rp m.)							
0	3976 (58.6%)	2805 (85.4%)	236 (40.4%)	4997 (75.9%)	1548 (53.5%)	3534 (64.6%)	3247 (70.6%)
>0–50	258 (3.8%)	228 (6.9%)	48 (8.2%)	211 (3.2%)	227 (7.8%)	169 (3.1%)	317 (6.9%)
>50–250	1217 (17.9%)	155 (4.7%)	161 (27.6%)	760 (11.5%)	451 (15.6%)	894 (16.3%)	478 (10.4%)
>250–500	410 (6.0%)	29 (0.9%)	54 (9.2%)	127 (1.9%)	258 (8.9%)	239 (4.4%)	200 (4.3%)
>500	921 (13.6%)	68 (2.1%)	85 (14.6%)	493 (7.5%)	411 (14.2%)	633 (11.6%)	356 (7.7%)
Annual Tax Payment (Rp m.)							
0	3470 (51.2%)	2458 (74.8%)	40 (6.8%)	5517 (83.7%)	371 (12.8%)	4035 (73.8%)	1893 (41.2%)
>0–2.5	1252 (18.5%)	545 (16.6%)	132 (22.6%)	566 (8.6%)	1099 (38.0%)	519 (9.5%)	1278 (27.8%)
>2.5–30	1563 (23.0%)	220 (6.7%)	342 (58.6%)	341 (5.2%)	1100 (38.0%)	654 (12.0%)	1129 (24.6%)
>30–62.5	233 (3.4%)	37 (1.1%)	37 (6.3%)	83 (1.3%)	150 (5.2%)	125 (2.3%)	145 (3.2%)
>62.5	264 (3.9%)	25 (0.8%)	33 (5.7%)	81 (1.2%)	175 (6.0%)	136 (2.5%)	153 (3.3%)
Total Unpaid Penalties (Rp)							
0	4532 (66.8%)	1345 (40.9%)	318 (54.5%)	3978 (60.4%)	1581 (54.6%)	3189 (58.3%)	2688 (58.5%)
>0-Avg. Monthly Tax Pmt.	812 (12.0%)	166 (5.1%)	178 (30.5%)	189 (2.9%)	611 (21.1%)	370 (6.8%)	608 (13.2%)
>Avg. Monthly Tax Pmt.	1438 (21.2%)	1774 (54.0%)	88 (15.1%)	2421 (36.7%)	703 (24.3%)	1910 (34.9%)	1302 (28.3%)
Audited Status							
No	6598 (97.3%)	3250 (98.9%)	577 (98.8%)	6450 (97.9%)	2821 (97.4%)	5388 (98.5%)	4460 (97.0%)
Yes	184 (2.7%)	35 (1.1%)	7 (1.2%)	138 (2.1%)	74 (2.6%)	81 (1.5%)	138 (3.0%)

Taxpayer Characteristics Descriptive Statistics Across Regional Development

	Regional Development			
	Q1 HDI ($N = 2446$)	Q2 HDI ($N = 4336$)	Q3 HDI ($N = 1963$)	Q4 HDI ($N = 1322$)
Age of Taxpayer (years)				
<20	5 (0.2%)	62 (1.4%)	11 (0.6%)	2 (0.2%)
20–29	154 (6.3%)	862 (19.9%)	380 (19.4%)	99 (7.5%)
30–39	537 (22.0%)	992 (22.9%)	616 (31.4%)	274 (20.7%)
40–49	584 (23.9%)	1035 (23.9%)	474 (24.1%)	334 (25.3%)
>50	1166 (47.7%)	1385 (31.9%)	482 (24.6%)	613 (46.4%)
Years Registered				
≤2	93 (3.8%)	723 (16.7%)	541 (27.6%)	178 (13.5%)
>2–5	253 (10.3%)	569 (13.1%)	594 (30.3%)	265 (20.0%)
>5–7	128 (5.2%)	426 (9.8%)	109 (5.6%)	123 (9.3%)
>7	1972 (80.6%)	2618 (60.4%)	719 (36.6%)	756 (57.2%)
Occupation				
Employee	1268 (51.8%)	2283 (52.7%)	1330 (67.8%)	588 (44.5%)
Non-employee	1178 (48.2%)	2053 (47.3%)	633 (32.2%)	734 (55.5%)
Strategic Taxpayer Status				
No	2434 (99.5%)	4319 (99.6%)	1958 (99.7%)	1277 (96.6%)
Yes	12 (0.5%)	17 (0.4%)	5 (0.3%)	45 (3.4%)
VAT Taxpayer Status				
No	2422 (99.0%)	4303 (99.2%)	1958 (99.7%)	1301 (98.4%)
Yes	24 (1.0%)	33 (0.8%)	5 (0.3%)	21 (1.6%)
Distance from Tax Office (km)				
≤5	356 (14.6%)	862 (19.9%)	211 (10.7%)	231 (17.5%)
>5–10	721 (29.5%)	1419 (32.7%)	70 (3.6%)	287 (21.7%)
>10–15	787 (32.2%)	522 (12.0%)	11 (0.6%)	103 (7.8%)
>15	582 (23.8%)	1533 (35.4%)	1671 (85.1%)	701 (53.0%)
Prior Year Tax Return Filing Channel				
No Report	79 (3.2%)	1462 (33.7%)	673 (34.3%)	259 (19.6%)
Electronic	2300 (94.0%)	2478 (57.1%)	1286 (65.5%)	695 (52.6%)
Hardcopies	67 (2.7%)	396 (9.1%)	4 (0.2%)	368 (27.8%)
Reported Annual Taxable Income (Rp m.)				
0	1378 (56.3%)	2598 (59.9%)	1802 (91.8%)	1003 (75.9%)
>0–50	96 (3.9%)	162 (3.7%)	65 (3.3%)	163 (12.3%)
>50–250	433 (17.7%)	784 (18.1%)	33 (1.7%)	122 (9.2%)
>250–500	209 (8.5%)	201 (4.6%)	16 (0.8%)	13 (1.0%)
>500	330 (13.5%)	591 (13.6%)	47 (2.4%)	21 (1.6%)
Annual Tax Payment (Rp m.)				
0	746 (30.5%)	2724 (62.8%)	1802 (91.8%)	656 (49.6%)
>0–2.5	438 (17.9%)	814 (18.8%)	107 (5.5%)	438 (33.1%)
>2.5–30	904 (37.0%)	659 (15.2%)	44 (2.2%)	176 (13.3%)
>30–62.5	154 (6.3%)	79 (1.8%)	5 (0.3%)	32 (2.4%)
>62.5	204 (8.3%)	60 (1.4%)	5 (0.3%)	20 (1.5%)
Total Unpaid Penalties (Rp)				
0	1837 (75.1%)	2695 (62.2%)	477 (24.3%)	868 (65.7%)
>0-Avg. Monthly Tax Pmt.	234 (9.6%)	578 (13.3%)	32 (1.6%)	134 (10.1%)
>Avg. Monthly Tax Pmt.	375 (15.3%)	1063 (24.5%)	1454 (74.1%)	320 (24.2%)
Audited Status				
No	2412 (98.6%)	4186 (96.5%)	1955 (99.6%)	1295 (98.0%)
Yes	34 (1.4%)	150 (3.5%)	8 (0.4%)	27 (2.0%)

Heterogeneity Indicators Descriptive Statistics and Balance Test Result

	Control ($N = 5085$)	Deterrence ($N = 1627$)	Information ($N = 1721$)	Simplification ($N = 1634$)	p-value
Region					0.996
Java	3428 (67.4%)	1094 (67.2%)	1162 (67.5%)	1098 (67.2%)	
Outside Java	1657 (32.6%)	533 (32.8%)	559 (32.5%)	536 (32.8%)	
Types of Penalty					0.400
Late Payment Only	315 (6.2%)	76 (4.7%)	101 (5.9%)	92 (5.6%)	
Late Filing Only	3333 (65.5%)	1076 (66.1%)	1114 (64.7%)	1065 (65.2%)	
Late Payment & Filing	1437 (28.3%)	475 (29.2%)	506 (29.4%)	477 (29.2%)	
Occupation					0.983
Employee	2760 (54.3%)	891 (54.8%)	934 (54.3%)	884 (54.1%)	
Non-Employee	2325 (45.7%)	736 (45.2%)	787 (45.7%)	750 (45.9%)	
Regional Development (HDI)					1.000
Q1 HDI	1240 (24.4%)	394 (24.2%)	422 (24.5%)	390 (23.9%)	
Q2 HDI	2188 (43.0%)	700 (43.0%)	740 (43.0%)	708 (43.3%)	
Q3 HDI	996 (19.6%)	323 (19.9%)	327 (19.0%)	317 (19.4%)	
Q4 HDI	661 (13.0%)	210 (12.9%)	232 (13.5%)	219 (13.4%)	

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