Enhancing Tax Compliance with Administrative Nudges: Experimental Insights from Indonesia

(Pre-Analysis Plan)

Subagio Effendi, Eko Yogama, Bagas Samodra,
Octa Sutantri, Muh Dularif, Agung Satyadini
DGT Indonesia

Abstract

This study explores the effectiveness of administrative nudges in promoting tax compliance among small businesses in Indonesia. Using a field experiment, we evaluate how low-cost, behaviourally informed interventions delivered through administrative letters—such as simplified content, deterrence messages, and social norm appeals—influence taxpayers' filing and payment behaviour. Compliance is assessed through observable taxpayer responses, with the experimental design enabling analysis of both long-term compliance and its dynamic patterns.

JEL-Classification: C93, H25, H26

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Correspondence regarding the AEA Registry Pre-Analysis Plan to Agung Satyadini, Directorate General of Taxes, Gatot Subroto 40–42, Jakarta, Indonesia. Email: agung.satyadini@kemenkeu.go.id.

1 Overview

1.1 Timing of Event

This trial is designed and implemented as part of a broader programme of field experimental work conducted by the Directorate General of Taxes (DGT). The first phase, a pilot project, will be undertaken in November 2025 in collaboration with selected DGT tax offices, during which approximately 16,000 letters will be distributed to taxpayers. This pilot will serve both to test the operational feasibility of the interventions and to generate preliminary evidence on their effectiveness. Long-term data collection is scheduled to continue until early 2026, allowing sufficient time to capture taxpayer responses across multiple reporting periods. Following the trial's registration in the AEA RCT Registry, the DGT will provide access to de-identified data on a restricted basis, ensuring that confidentiality and data protection standards are maintained while enabling rigorous independent analysis.

1.2 Interventions

The experimental design focused on improving small businesses' tax compliance, particularly related to responses to administrative nudges which affecting their tax monthly payment and tax return submission compliance.

This trial employs three treatment letters: (1) a simplification letter, which reduces complexity in the existing correspondence, improves visual design, and adopts a less formal style; (2) a deterrence letter, which emphasises administrative penalties for non-compliance, the potential application of computerised audits, and subsequent enforcement actions; and (3) a public goods provision letter, which highlights taxpayers' contributions to the national budget, with particular reference to public expenditure. Supplementary informative flyers are appended to the literacy and public goods provision letters. The use of colour schemes and graphical elements in the literacy and social norm letters is informed by the literature on colour psychology, with the objective of enhancing cognitive and affective engagement.

For the length of the experiment, the treatments will be contrasted with a control group comprised of individuals who did not receive the letters. The treatment impact of each intervention will be determined by comparing the average outcomes of the interven-

tion group to those of the control group. There will be no interaction testing between treatments.

1.3 Randomisation

To ensure credible stratified randomisation, taxpayers with comparable baseline characteristics were grouped into strata. Within each stratum, cases were randomly allocated to one of the treatment groups or to the control group, thereby achieving a balanced distribution of baseline characteristics across groups. Randomisation was implemented in `Stata®` using a random variable generator with randomly selected seeds. For stratified randomisation, the user-written command `randtreat` (version 1.4) was employed.

2 Regression Spesification

In this trial, we compare the responses of small businesses on each treatment group and control group under separate regression models. Each model includes n_t taxpayers assigned on treatment group t, $t \in [1,\ 2,\ 3]$ and n_0 taxpayers assigned to the control group. We control for a set of baseline characteristics including region, sector, age, and turnover. We also anticipate the longitudinal analysis of covariance in estimating the treatment effect. The empirical model is formalised as follows:

$$Y_i^t = \beta_0^t + \beta_1^t T_i^t + \beta_2^t X_i^t + \beta_3^t P_i^t + \beta_4^t \mathrm{T}_i^t P_i^t + \varepsilon_i^t \tag{1}$$

where Y_i^t is a given outcome of taxpayer i. T_1^t is the treatment indicator for the comparison of treatment group n_t to the control group n_0, P_i^t is period, X_i^t is a vector of baseline characteristics, and ε_i^t is the model error term.

This experiment will examine the long-term effect of the interventions by assessing the number of individuals with tax payment and reporting who: (1) reached a particular amount, and (2) returned to their initial value after the intervention, over a period of time, given by:

$$\hat{S}(t) = \prod_{i:t_i \leq t} \left(1 - \frac{a_i}{n_i}\right) \tag{2}$$

where t_i is a timeframe the payment amount is reached or returned to the initial value, a_i is the number of taxpayers acheieved the payment amount or returned to the initial value, and n_i is the taxpayers not yet achieved the particular amount of payment. Variables that capture the behaviour of taxpayers with regard to payment, submission, and response are key outcome measures. The following are the primary outcome variables:

- Number of inbound communication to tax office.
- Dummy indicating improvement in tax filing.
- Dummy indicating increase in tax payment.
- Amount of tax payment.
- Dummy indicating timely tax filing.

3 Mechanisms

In our conceptual framework, we developed model predictions by utilising several parameters that influence the taxpayer's decision namely y, the taxpayers's income, p, the perceived probability of detection, τ, the tax rate, s, the penalty rate, δ, the filing transaction cost, θ, the social guilt factor, and n, the prevalence of noncompliance in the society. We derive the following comparative statics to guide our thinking about the effect of changing the parameters as follows:

$$\frac{\partial e^*}{\partial p} = -\frac{f_p(e^*(p), p))}{f_e(e^*(p), p))} = \frac{\tau s u'(x^a) + \tau u'(x^b)}{f_e(e^*)} < 0 \tag{3}$$

$$\frac{\partial e^*}{\partial \theta} = -\frac{f_\theta(e^*(\theta), \theta))}{f_e(e^*(\theta), \theta))} = \frac{c(n)}{f_e(e^*)} < 0 \tag{4}$$

$$\frac{\partial e^*}{\partial \delta} = -\frac{f_\delta(e^*(\delta), \delta))}{f_e(e^*(\delta), \delta))} = \frac{-p\tau s u''(x^a) + (1-p)\tau u''(x^b)}{f_e(e^*)} \tag{5}$$

The sign of $\frac{\partial e^*}{\partial \delta}$ is ambiguous.

$$q(t) = 1 - \mathbb{P}(\tau = t | \tau \geq t) \tag{6}$$

The comparative statics so far give us the following predictions with an internal solution:

1. Prediction 1: An increase in perceived probability of detection, p, would decrease the evasion amount, or increase the declared amount and tax paid.

2. Prediction 2: An increase in the social guilt factor, θ, would decrease the evasion amount, or increase the declared amount and tax paid.

3. Prediction 3: An decrease in the filing transaction cost, δ, would decrease the evasion amount, or increase the declared amount and tax paid, if the perceived probability of detection and/or the penalty rate are big enough.

4. Prediction 4: The probability of the treatment effects on declared amount and tax paid is longer than t is ≥ 0.