Doctoral Dissertation

Essays on Tax Compliance in Indonesia

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March 2022

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D180565

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A Dissertation Submitted to
the Graduate School for International Development and Cooperation
of Hiroshima University in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy

March 2022

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ABSTRACT

There are two forms of tax compliance which are enforced compliance and voluntary compliance. In enforced compliance, people are forced to comply with tax regulation by using enforcement approaches from tax authorities. On the contrary, in voluntary tax compliance, which is closely related to people's willingness to pay taxes, people's willingness to pay taxes is closely related to their individual attributes, the provision of public goods and services, and government strategies which mainly consist of deterrence and non-deterrence strategies. Therefore, tax compliance literature mainly tries to explain the various pattern of tax non-compliance related to demographic characteristics of individuals and examines several factors that affect people's willingness to pay taxes. The main objective of this study, thus, is to identify the characteristics of taxpayers who engage in tax evasion (chapter 2), to explain the causal effect of information on the types of public spending on people's willingness to pay taxes (chapter 3) and the causal effect of government's strategies on people's tax-paying behaviors (chapter 4).

Chapter 2 aims to identify the patterns of non-compliance of the taxpayers who engage in non-compliant behavior, which is crucial for tax authorities to determine appropriate taxation schemes. Taxpayers have an incentive to conceal their actual income. Therefore, it is difficult for tax authorities to uncover such behavior (social desirability bias). Our study mitigates the bias in responses to sensitive questions by employing the list experiment technique, which allows us to identify the characteristics of taxpayers who engage in tax evasion. Using a dataset obtained from a tax office in Jakarta, Indonesia, we conducted a computer-assisted telephone interviewing survey in 2019. Our results revealed that approximately 13 percent of the taxpayers, old, male, had reported lower income than their actual income on their tax returns. In addition, taxpayers who are old, male, corporate employees, and members of a particular ethnic group tend to exhibit relatively low tax compliance. These findings suggest that our

research design can be a useful tool for understanding tax evasion behavior and developing more effective taxation schemes that promote tax compliance among taxpayers.

Chapter 3 investigates the effect of government spending on the willingness to pay taxes. Governments coordinate people's various interests through budget allocations for the provision of public goods and services. To maintain the government's budgetary power, it is vital to secure revenues and increase people's willingness to pay taxes. To understand whether government measures exert any influence on the willingness of individual taxpayers to pay taxes, we conducted a survey experiment that varied the information on the government's fiscal spending in a vignette experiment. Our results show that while providing information about public spending on healthcare and infrastructure development did not change the respondents' willingness to pay taxes, emphasizing industrial subsidies reduced it significantly. These findings imply that targeting specific groups without careful communication could weaken the reciprocal relationship between the government and the public, thus mitigating taxpayers' cooperative behavior in terms of tax payment.

Chapter 4 examines the effect of various tax policy strategies to improve the likelihood of taxpaying. It is important for the government to investigate particular strategies that effectively increase people's willingness to pay taxes. In the experiment, we design a novel vignette experiment in which we provide different strategies (perceived audit probability, reciprocity, and peer-effect) and a fictional subject's characteristics (gender and ethnicity) to influence tax payment behaviors. The results indicate that perceived audit probability and positive peer-effect information positively affect people's tax payment behavior, while the negative peer-effect and reciprocity information has a negative effect on people's tax payment behavior.

ACKNOWLEDGEMENTS

This dissertation is available through great assistance, encouragement, and prayers from many people. Thus, I would like to appreciate all this supports to the contributors.

First of all, I would like to express my sincere gratitude to my main supervisor Prof. Makoto Kakinaka for the continuous support, advice, encouragement, and motivation throughout my doctoral course at Hiroshima University. His guidance inspired me to complete all the requirements for the degree of Doctor of Philosophy. I am also grateful to Prof. Yoshikuni Ono for his helpful comments and suggestions during the research, particularly related to the experiments in this dissertation. For my thesis committee, Prof. Masaru Ichihashi, Prof. Singo Takahashi, and Prof. Daisaku Goto, I would like to thank them for their insightful suggestions to enrich my research.

Secondly, I incredibly acknowledge the support from the Indonesian government through Indonesia Endowment Fund for Education (LPDP) during my doctoral course.

For all my family, my wife, my daughter, my parents/parents-in-law, my brothers and sisters, I would like to appreciate their supports throughout the tough time of my study.

Lastly, I am indebted to the Ministry of Finance and Directorate General of Taxes which allowed me to pursue a doctoral degree and several tax offices that helped me conduct experiments. To my lab-mates in Kakinaka sensei's lab, their supports are highly appreciated.

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Chapter 1

Introduction

There are three dimensions of tax compliance: timely filing, timely payment, and accurately reporting (Slemrod et al., 2001). The first and second dimensions are related to formal compliance and the third dimension is related to material compliance. Within these dimensions, the literature in tax compliance primarily aims to explain the pattern of tax non-compliance behaviors within individuals and organizations and investigates strategies that effectively reduce tax-non-compliance and increase people's willingness to pay taxes (Andreoni et al., 1998).

It is essential to acknowledge the different mechanisms which motivate the willingness to pay taxes, tax compliance, and tax non-compliance. Therefore, tax compliance can be differentiated into enforced and voluntary compliance. In enforced compliance, people comply with the tax regulations because the governments enforce the regulation by, for instance, tax auditing. However, some studies examine that this approach alone is insufficient to improve tax compliance (Kastlunger et al., 2010; Mittone et al., 2017). To overcome this issue, recent studies find out that intrinsic motivation (tax morale) plays an essential role in shaping people's behaviors toward taxes (Alm et al., 1993; Lubian & Zarri, 2011; Torgler, 2012). This motivation affects people's willingness to comply voluntarily. Voluntary compliance, which is closely related to willingness to pay taxes, can be shaped through two mechanisms, reciprocal argument and social norms argument. In these mechanisms, the sense of fairness plays a role. People's trust in the government will increase if they believe that the governments treat people equally and provide public goods and services fairly, and in turn, their motivations to pay taxes will increase. Within these arguments, this study aims to examine the factors that motivate people's willingness to pay taxes in the context of a developing country. Because of the differences in tax compliance

behaviors among individuals, this study also tries to identify the characteristics of taxpayers who engage in tax non-compliance.

Our second chapter extends the analysis of tax non-compliance by identifying the characteristics of taxpayers who do not comply with tax regulations. An effective tax collection is an important issue in government finance because tax revenue contributes to a significant portion of a government's revenue. However, tax evasion significantly reduces the government's revenue and will damage the fiscal balance, particularly in developing countries. Therefore, governments are prompted to pursue effective taxation policies to minimize tax evasion. For this purpose, the first step is identifying the characteristics of taxpayers who are reluctant to comply with tax laws (Slemrod, 2008). However, it is challenging to identify which kinds of individuals engage in this behavior since taxpayers have incentives to conceal their tax evasion (Alm 2012; Mascagni 2018). Taxpayers may falsefully report socially desirable or acceptable answers if they are asked directly if they comply with the tax payment rules.

We apply a list experiment to avoid social desirability bias from field surveys and elicit sensitive information about taxation. This questionnaire design technique allows us to minimize the social desirability bias in responses to sensitive questions. List experiments have been used to control for the bias associated with sensitive topics in various social science fields, particularly in political science. Despite the popularity of this experimental method, our study is the first attempt to use the list experiment technique in a developing country to identify which taxpayers comply when filing returns.

Using taxpayers list, we conducted a CATI survey in Jatinegara District of Jakarta Province of Indonesia in 2019. Our final responses are 879 taxpayers. The findings show that 13 percent of taxpayers had engaged in tax evasion by reporting their income lower than the actual one. We also find that taxpayers' characteristics, including age, gender, ethnicity, and employment status influence taxpayers' decision to comply. Our results may help tax authorities to design effective

tax auditing programs for specific groups of taxpayers. In addition, tax authorities could change their taxpayers' database structure and administrative management by collecting the necessary information on individual taxpayers. Meanwhile, taxpayers' privacy should be protected carefully by the government.

The third chapter works on the causal relationship between the government's spending and people's willingness to pay taxes. Governments coordinate people's various interests through budget allocations for the provision of public goods and services. To do so, securing revenues and ensuring people's willingness to pay is important to maintain budgetary power. If people can identify high government spending performance in areas they are comfortable with, they are willing to pay taxes (Alm et al., 1993; Glaser & Hildreth, 1999). This is because citizens generally expect excellent performance from their governments, including high-quality public goods and services. Moreover, rational budget allocation is considered one of the key factors that increase trust in government and influence citizens' attitudes toward tax payment (Alm et al., 2006).

Reciprocity shapes people's taxation awareness, including their willingness to pay taxes. People's attitudes are affected by the interaction between the government and taxpayers through budget allocation. Accountability may also improve their perception of an exchange of fairness between their contributions and the services they receive. This mechanism increases cooperative behaviors on their tax obligations (Leder et al., 2010). On the other hand, the unfairness of fiscal exchanges could discourage taxpayers from being cooperative. Taxation, which represents the state's ability to finance necessary public expenditures, is likely to promote a social contract between the state and its citizens, which in turn is likely to increase revenues (Martin & Prasad, 2014). In our study, we conducted a survey experiment in Jakarta, Indonesia, to examine what kind of information about government spending actually influences people's willingness to pay taxes.

Our study has the distinctive features from previous studies: First, most studies, which have investigated the connection between the types of public goods and services to tax compliance,

examined cases from developed countries (Alm et al., 1993; Casal et al., 2016; Doerrenberg, 2015; Glaser & Hildreth, 1999; Lamberton et al., 2017; Robbins & Kiser, 2018). However, there is a lack of study on the issue of willingness to pay taxes in developing countries. In fact, due to the limitations on tax enforcement under weak institutional frameworks, developing countries generally suffer from tax evasion more than developed countries (Crivelli et al., 2016). Second, most existing studies on identifying taxpayers' preferences rely on laboratory experiments (Alm et al., 1993; Casal et al., 2016; Doerrenberg, 2015) or traditional surveys (Ali et al., 2014). However, the observed attitudes of respondents in a laboratory experiment may not reflect their actual decisions since they are aware of the artificial setting of the experiment (Mascagni, 2018).

A vignette experiment overcomes these problems by randomly exposing respondents to a short story consisting of several characteristics of the actor mimicking real-life situations (Dulmer, 2007). Because the respondents do not realize the aspects and conditions that are of interest in the research, this design avoids social desirability bias problems on sensitive issues (Steiner et al., 2016). The vignette technique allows us to identify the causal effect of conditional factors, such as the types of public goods and services and taxpayers' characteristics, on taxpayers' attitudes. Therefore, to the best of our knowledge, this study is the first attempt at evaluating the effect of the types of public spending information on people's willingness to pay taxes, in the framework of a vignette experiment in a developing country.

For these purposes, we include three types of public spending: infrastructure, healthcare, and industrial subsidy. By conducting a CATI survey in Jatinegara District of Jakarta Province of Indonesia in 2019, we finally collected 879 responses from taxpayers. The results show that exposing the information of budget allocation into subsidies to a large company reduce people' willingness to pay taxes more substantial than exposing the information of budget allocation into healthcare sector and infrastructure sector. This result implies that industrial subsidies may have a

negative effect on people's willingness to pay taxes although this policy is an important tool for economic growth.

The fourth chapter investigates tax policy strategies to induce willingness to pay taxes. To ensure high taxpaying behaviors, tax authorities utilize various tax policy strategies from deterrence to moral suasion. However, the effect of each policy varies. Therefore, identifying the most effective approach to motivate individuals to pay their taxes is one of the key topics for scholars and governments worldwide (Andreoni et al., 1998).

The questions related to deterrence effects, particularly in the scope of audit probability, are central in the tax literature (Andreoni et al., 1998). Some studies argue that deterrence is effective to motivate taxpaying (Castro & Scartascini, 2015; Pomeranz, 2015), while other studies find that audit has little effect and may not persistently encourage tax payment (Kastlunger et al., 2009; Mittone et al., 2017).

Similarly, tax morale also contributes to a significant portion of taxpaying attitudes through reciprocal argument and peer-effect argument. This chapter aims to identify the causal effect of deterrence strategy and moral suasion on an individual's taxpaying behavior by conducting a vignette experiment in a developing country, Indonesia. We particularly utilize perceived audit probability as a deterrence strategy and introduce two versions of moral suasions: reciprocal and peer-effect arguments.

We contribute to the growing tax literature in several ways. First, little is known about the effectiveness of perceived audit probability and moral suasion in improving tax payment in the context of individual income tax. The exception may include the work of Bott et al. (2020) which analyzes the strategies in the scope of foreign income tax in Norway. Our study provides clear evidence of different effects of audit probability and moral suasion in individual income tax. Second, to the best of our knowledge, no studies utilize actual taxpayers` responses and apply a

vignette experiment to explore tax-paying behaviors of individual income tax in developing countries.

Our results find that the deterrence strategy encourages taxpaying behavior. In addition, we also find that the effect of peer-effect information on individual's taxpaying behavior depends on the context of the messages. In addition, an individual's taxpaying behavior is weakened by both types of information indicating the government's administrative efforts in improving infrastructures and social services (positive reciprocity) and that indicating governments' inefficiency in providing infrastructures and social services (negative reciprocity). These results imply that deterrence strategies and positive peer-effect information effectively encourage people's willingness to pay taxes, particularly in Indonesia. Meanwhile, the societal benefit information that discourages tax payment should carefully be applied to minimize the adverse effect on people's willingness to pay taxes.

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Chapter 2

Tax compliance and social desirability bias of taxpayers: Experimental evidence from Indonesia

2.1 Introduction

Effective tax collection is an important issue in government finance because taxes comprise a significant portion of a government's revenue. Tax evasion is an illegal behavior that reduces the government's revenue and can damage the fiscal balance, hindering economic growth especially in developing countries. Crivelli et al. (2016) estimate that worldwide revenue losses to tax evasion amount to around $650 billion per year and that developing countries experience one third of those losses, while high income countries experience much smaller revenue losses, as indicated by Cobham and Jansky (2018) that the great intensity of revenue losses occurs in low-income countries. The revenue losses resulting from tax evasion attract public attention, which prompts governments to pursue effective taxation policies. Identifying the characteristics of taxpayers who are reluctant to comply with tax laws is the first step toward establishing effective tax enforcement schemes (Slemrod, 2008).

Since the seminal work of Allingham and Sandmo (1972), many scholars have examined factors that affect taxpayers' compliance behavior. Some studies have explored psychological factors by conducting laboratory experiments (Christian & Alm, 2014; Fochmann & Kroll, 2016) or field experiments (Dunn et al., 2018; Hasseldine & Hite, 2003). However, since taxpayers have incentives to conceal their tax evasion, it is very difficult to identify which kinds of individuals engage in this behavior (Alm, 2012; Korndörfer et al., 2014; Mascagni, 2018). When taxpayers are asked directly if they comply with the tax payment rules, they may falsefully report socially desirable or acceptable answers. This response bias is said to occur when the research question involves socially sensitive issues, including politics, religion, and taxation. In the context of

taxation, tax evasion is more severe in developing countries than in developed countries because the latter have advanced tax systems (Pomeranz, 2015).

Our study aims to identify the characteristics of taxpayers who do not comply with tax payment rules. To avoid social desirability bias from field surveys and to elicit sensitive information about taxation, we use a list experiment. This is a questionnaire design technique that allows us to minimize the social desirability bias in responses to sensitive questions. List experiments have been used to control for the bias associated with sensitive topics in various fields of social science, particularly in political science. These studies have dealt with topics such as support for a female president (Burden et al., 2017), voter turnout (Holbrook & Krosnick, 2010), same-sex marriage (Lax et al., 2016), conservation crime (Nuno & John, 2015), and animal disease (Randrianantoandro et al., 2015). Despite the popularity of this experimental method, it has not so far been applied in research on taxation to our knowledge. Our study is the first attempt to use the list experiment technique in a developing country in order to identify which taxpayers comply when filing returns.

For our research, we collaborated with the Directorate General of Taxes (DGT), which is the tax authority in Indonesia. Using the list of taxpayers provided by the DGT, we implemented a computer-assisted telephone interviewing (CATI) survey of taxpayers who had filed their income tax forms in Jatinegara District, Jakarta Province, Indonesia. The survey was conducted between January and March in 2019, and 879 taxpayers participated in our phone interviews.

To preview the results of our list experiment, we found that around 13 percent of taxpayers had reported lower income on their tax returns than they actually earned. In particular, taxpayers who were old, male, Sundanese, or corporate employees showed low tax compliance behavior. We believe that these results can help the tax authority design audit programs targeting specific groups of taxpayers to improve tax compliance. Based on our findings, the tax authority could design an

effective taxation policy to increase tax revenues, including targeted groups of taxpayers that should be audited closely and continuously.

This article consists of five sections. In the next section, we review the previous literature on tax compliance. The third section explains Indonesia's tax structure. The fourth section discusses the empirical analysis, including the survey design, data, and results of the study. In the final section, we summarize our findings and provide our conclusions.

2.2 Taxpayers and their compliance behavior

Conventional studies of tax compliance have focused on efforts by tax authorities to deter non-compliance by taxpayers. Most of these studies investigate how taxpayers change their behavior in response to changes in the probability of being detected and the levels of potential sanctions and penalties. From a theoretical perspective, Allingham and Sandmo (1972) argue that tax compliance improves as the probability of detection increases and the punishments become more severe. However, recent studies criticize the traditional approach, emphasizing that other motivations play important roles behind tax compliance behavior (Alm et al., 1992). People pay taxes out of a recognition of the social benefits of public services and public goods provided by the government. Some studies point out that intrinsic motivation, including tax morale, also promotes tax compliance (Lubian & Zarri, 2011; Torgler, 2012).

Taxpayers cannot be described as a single identical group because of the diversity in their behaviors (Alm, 2012). The heterogeneity among them must be acknowledged in explaining individuals' tax compliance behaviors. Indeed, many empirical studies show that tax compliance behavior varies across citizens depending on their demographic attributes and socio-economic characteristics, including age, gender, income, and education (Brockmann et al., 2016; Hofmann et al., 2017; Kastlunger et al., 2010; Lago-Penas & Lago-Penas, 2010; Russo, 2013), culture (Alm & Torgler, 2006; Kountouris & Remoundou, 2013), employment status and religion (Lago-Penas

& Lago-Penas, 2010), and trust in and perceptions of government (Batrancea et al., 2019; D'Attoma, 2020; Jimenez & Lyer, 2016; Kirchler et al., 2008; Kogler et al., 2013).

Regarding the link between age and tax compliance behavior, the existing literature gives mixed results. Several works argue that older generations have different social values and behavior toward the state and regulation from younger ones. For instance, Hofmann et al. (2017) claim that old generations, who need social security and health care benefits, treasure the benefit of taxes and thus become more compliant than young generations do. Kirchler (2007) also argues that older people tend to have a better financial situation as well as fewer budgetary constraints, which make them become tax compliant. In contrast, however, some studies show the opposite, that older people are less tax compliant. Russo (2013) argues that older people exhibit lower tax compliance behavior because they are dissatisfied with public services.

Concerning the relationship between gender and tax compliance, most studies show that women are more likely to be compliant than men (Betz et al., 1989; White, 1999). Hofmann et al. (2017) claim that women are generally more ethical and have stronger morals than men, so that they are more tax compliant. Hasseldine (1999) also suggests that women tend to perceive sanctions for misbehavior or non-compliant behavior as more severe and threatening than men.

People with different income levels may also behave differently in tax compliance, but again the literature shows mixed results on the relationship between income level and tax compliance behavior. Some studies show that lower-income people are less compliant since they are more sensitive to their after-tax income (Hofmann et al., 2017). In contrast, other studies demonstrate that higher-income people exhibit lower compliance because progressive tax schemes affect higher-income earners more substantially (Andreoni et al., 1998; Chung & Trivedi, 2003; Hofmann et al., 2017). The relationship between educational attainment and tax compliance is also unclear. Some studies show that highly educated people tend to be less compliant because they have an incentive to avoid taxes by utilizing their knowledge and understanding of financial

transactions (Hofmann et al., 2017) and because they are more critical of the state's actions (Torgler & Schneider, 2007). However, less educated people are also said to have an incentive to cheat on their taxes because they have a limited understanding of their tax duties or lack financial literacy (Hofmann et al., 2017).

Several studies show a strong relationship among culture, religiosity, and tax compliance. Culture can significantly affect one's tax compliance behavior by shaping the intrinsic motivation to comply (tax morale) as the moral principle or value (Kountouris & Remoundou, 2013). Alm and Torgler (2006) suggest that differences in tax compliance behavior observed across countries is due to differences in citizens' tax morale. Religiosity can be one potential factor that shapes tax morale because people tend to follow a particular religion's guidance in forming their preferences (Mueller, 2001; Torgler, 2006). In addition, religion encourages moral commitments and the internal enforcement of social norms (Anderson & Tollison, 1992; Torgler, 2007).

Tax compliance is also likely to be associated with employment status, because employees generally pay income tax through the withholding system, which minimizes their tax evasion opportunities (Yaniv, 1988). Citizens' perceptions of the government is also important. Trusted government institutions are likely to encourage many citizens to engage in social cooperation (Kreps, 1990) and thus improve their tax compliance behavior (Scholz & Lubel, 1998; Torgler, 2007). The level of government institutional quality and trustworthiness certainly explains the variation in tax compliance across countries (D'Attoma, 2020).

To identify which demographic attributes and socio-economic characteristics relate to tax evasion or tax non-compliance behavior, empirical studies have used various methodologies. Torgler (2007) notes that these methods have mainly consisted of surveys, laboratory experiments, and field experiments. Because tax data are confidential, surveys are popular among researchers (Torgler, 2007). Kountouris and Remoundou (2013) examine tax morale in Europe using data drawn from the European Social Survey (ESS). Ali et al. (2014) utilize data from the

Afrobarometer survey for five countries in Africa. Although these surveys enable researchers to analyze tax compliance behavior empirically in numerous countries, they suffer from issues such as low response rates and the inaccuracy of the responses due to the sensitive nature of tax compliance, which demotivates people from participating in the surveys (Torgler, 2007). Respondents may alter their answers to conform to the acceptable norms in society (Hallsworth, 2014).

While laboratory experiments could be used to avoid the bias associated with the sensitive issue of tax compliance, there are concerns about the external validity of this methodology. In the real world, a lot of crucial factors other than those manipulated in experiments might also affect an individual's decision to comply (Hallsworth, 2014; Mascagni, 2018; Torgler, 2007). Moreover, when respondents are drawn from some specific groups, such as students (Alm et al., 2017; Durham et al., 2014), their decisions are not representative of the overall population of taxpayers (Hallsworth, 2014). To avoid these issues, recent studies have conducted field experiments to investigate how tax compliance behavior is influenced by a government's actions, such as social norm letters (Biddle et al., 2018), third-party information (Carrillo et al., 2017), field inspections (Rincke & Traxler, 2011), deterrence letters (Shimeles et al., 2017), and audit paper trails (Pomeranz, 2015). Field experiments could mitigate the problems encountered in surveys and laboratory experiments, as they use data from real taxpayers, reflecting the decisions they actually make in real life.

To create effective taxation policy, including audit schemes, the government also needs enough information about the characteristics of individuals who engage in tax evasion. Nevertheless, taxation is a sensitive issue for taxpayers, making it generally difficult for the government to obtain precise information about their behavior, because they may provide false answers or even refuse to answer any questions from the government. To address these problems, we conducted a field survey with an experimental component, a list experiment or an item count

technique (ICT), which is an indirect question technique. The list experiment technique protects respondents' privacy by not requesting that they disclose their answers on sensitive issues. The list experiment questions are designed such that the results show only the number of affirmative answers rather than answers to sensitive questions which are socially undesirable (Corstange, 2009; Blair & Imai, 2012, Gonzalez-Ocantos et al., 2012). Because of this advantage, list experiments have grown in popularity in the social sciences.

2.3 Individual taxation in Indonesia

This study employs Indonesia as the subject country. Indonesia is classified by the World Bank as a lower middle-income country (LMIC), and the country shares common tax-related problems with other LMICs. In fact, Indonesia's tax-to-GDP ratio is relatively small, reaching only 10.3 percent in 2016. Among the ASEAN member countries, Indonesia is ranked the second lowest, following Myanmar. The average of tax-to-GDP ratio over the ASEAN member countries is 12.6 percent in 2016. Given this situation, the government has set its target for the tax-to-GDP ratio at around 13 to16 percent during the period of 2031-2035 as part of the Medium-Term Fiscal Macro Strategy 2020-2024.

Table 2.1 The Proportion of individual income tax to total income tax (billion rupiah)

	Amount (billion Rupiah)	% of Total Income Tax	% of Total Central Tax
Income Tax			
Individual	7,806	1.21%	0.58%
Corporate	206,550	31.93%	15.37%
Other Income Tax	432,437	66.86%	32.19%
Total Income Tax	646,793	100.00%	48.14%
Total Central Tax	1,343,529		100.00%

Note: Other income tax includes oil and gas income tax, income tax article 21,22, 22 Import, 23, 26, final income tax, fiscal income tax, and income tax borne by the government.
Source: Central Government Financial Report-Audited.

This study focuses on taxes on individuals, particularly income tax, among various forms of taxes in Indonesia. Income tax is collected using a self-assessment system. There are two types of individual taxpayers: self-employed individuals and employees. Self-employed individual taxpayers calculate the amount of their own taxes and report it to the tax office. On the other hand, for employees, income tax is calculated and paid by their employers from their salary or wage, using the withholding tax system. At the same time, employees often receive additional income from their own business activities in addition to their salaries or wages. Thus, all employees need to report incomes from their employers, as well as their additional income in order to calculate the total amount of income tax they owe on their tax returns. However, due to the lack of third-party reporting to capture additional incomes from their business activities, taxpayers might not report all of their income on their tax returns, making honesty and willingness to pay taxes crucial for individual tax collection.

Concerning the administrative structure of the tax authority in Indonesia, the DGT consists of more than 340 tax offices in 34 provinces, which are responsible for collecting central taxes, such as income taxes, value-added taxes, and land and building taxes in four sectors (forestry, plantation, oil and gas, and mining). In addition to usual tax offices, there are two types of special offices, large tax offices (LTOs) and special tax offices (STOs) in Jakarta. The LTOs' responsibility is to serve and monitor large taxpayers in Indonesia, while the STOs are responsible for handling special cases of corporations, such as state-owned enterprises and foreign multinational corporations. The former consists of four offices and one regional office, and the latter consists of nine offices and one regional office. According to a report from the government of Indonesia in 2018, individual and corporate income tax revenues represented 1 percent and 32 percent, respectively, of total tax revenue in 2017 (see Table 2.1). The low level of individual income tax revenue has encouraged the tax authority to increase individual tax compliance.

According to BPS-Statistics Indonesia, Jakarta is the largest political and commercial city in Indonesia. It also has the highest density of any city in Indonesia, with more than 15,000 people per square kilometer. The population includes a variety of social, ethnic, and religious groups (BPS-Statistics Indonesia 2018). The amount of tax revenue collected in Jakarta is much larger than in other provinces. According to the DGT, 18.5 percent of total central tax revenue in 2017 was collected from taxpayers located in this city. Jakarta consists of six regencies and 44 subdistricts, and 54 tax offices cover these areas. Our study area is the Jatinegara subdistrict of Jakarta province. According to BPS-Statistics of Jakarta Timur, Jatinegara subdistrict consists of eight villages with 310,494 people living in a 10.25 square kilometer area. The land-use is mainly for housing, which occupies 71.12 percent of the area, and the land-use for industry is around 5.19 percent of total land-use. This means that few industries operate in this subdistrict. On the other hand, there are 116 markets, including traditional markets and restaurants, indicating that trade in goods and services is the main business activity in this subdistrict.

2.4 Empirical analysis

2.4.1 List experiment

This study employed a list experiment or item count technique to mitigate respondents' social desirability bias when eliciting information about sensitive issues. To conduct a list experiment, respondents were randomly separated into two groups: the control group and the treatment group. Respondents were presented a list of statements and then asked to report how many statements on the list pertain to them. The list of statements shown to the respondents in the control group consisted of four statements (we call them "control statements") that are not directly related to our research interest. We considered three issues when designing the control statements. First, there is a possibility that the respondents report all of the statements (or none of the statements) pertain to them. This creates a ceiling and floor effect problem (Blair & Imai, 2012). A major concern over

these effects is the lack of privacy protection for the respondents. To mitigate this issue, the four control statements were designed so that few respondents in the control group would answer affirmatively or negatively to all of them (see Blair & Imai, 2012; Glynn, 2013). Second, the list experiment needs to satisfy a no-design effect assumption that responses to the control statements are not affected by the additional treatment statement (Blair & Imai, 2012). To avoid this issue, as suggested by prior works, we carefully chose four control statements about which respondents were likely to have strong opinions. Third, other potential problems include respondents rushing to complete the survey or misinterpreting it, and administrators making coding errors (Ahlquist, 2018). To avoid these problems, we trained the interviewers by conducting a pilot survey in advance and confirmed the validity of our experimental design. The list of statements shown to the respondents in the treatment group composed of five statements, adding one statement (we call it a "treatment statement") that directly related to our research interest. The treatment statement might invite a social desirability bias, but with a large enough sample size, this design enabled us to estimate the proportion of respondents to whom the treatment statement of interest pertained. It is calculated by subtracting the average number of statements reported by the respondents in the control group from the average number of statements reported by the respondents in the treatment group. Arranging the statements in this way ensured a level of privacy for the respondents in the treatment group because whether or not the treatment statement pertained to them cannot be inferred by the researchers, unless they chose either all of the statements or none of them.

To reiterate, the objective of our study was to elicit taxpayers' attitudes toward tax compliance. By conducting a list experiment, we attempted to estimate the proportion of taxpayers who had reported an amount for their income on their income tax forms *lower* than their actual income. There were four control statements and one treatment statement. The treatment statement was the item directly related to the respondent's tax compliance behavior. We randomly separated our respondents into two groups: a treatment group and a control group. Only the first four control

statements were presented to respondents in the control group, and all five statements were presented to respondents in the treatment group. The order in which statements were presented was completely randomized across respondents to minimize the possibility of any order effect. After presenting a list of these four or five statements, we specifically asked each respondent to identify how many statements apply to her/him. It should be noted that, unlike traditional social surveys that directly ask respondents to answer which statement(s) apply to them, the list experiment asks respondents to state only the number of statements that apply to them. This may cause some respondents to become suspicious about the objective of our survey and discourage their cooperation. To minimize this possibility, we followed the suggestions of Tsuchiya et al. (2007), and chose a control statement that has a similar degree of social desirability bias to the treatment statement. This control statement is "I have paid a bribe to a police officer to get away with a violation," which occurs relatively frequently in Indonesia but is socially sensitive. By doing so, we encouraged our respondents to cooperate with our survey without revealing the true purpose of our study. The exact wordings of these statements are as follows:

Control statements

- I have more than one sister.
- I have paid a bribe to a police officer to get away with violation.
- I went to a private high school.
- I talked about politics with other people during the previous election.

Treatment statement

- I have reported an amount lower than my actual income in my tax report.

We used the unique list of all taxpayers obtained from the tax office in the Jatinegara subdistrict of Jakarta province to conduct our list experiment. We obtained the approval of the Head office of Jatinegara Tax Office to access to the taxpayers list. This list includes 121,330 individual taxpayers in the district. Among those taxpayers, we excluded non-effective taxpayers,

non-filing taxpayers, and taxpayers without the information of their phone numbers. Non-effective taxpayers are those who do not need to file tax returns and pay taxes, due to factors such as unknown addresses or having gone out of business. However, these taxpayers' statuses can be switched into effective taxpayers if those factors change, either by the taxpayer's requests or by tax officers' request. Non-filing taxpayers are those who have not filed tax returns in the past two years consecutively. This leaves us a total of 14,428 taxpayers who have submitted their tax returns from 2013 to 2017. Using the final list of the taxpayers, we implemented a survey including our list experiment question using computer-assisted telephone interviewing (CATI) from January 2019 to March 2019, and we collected responses from a total of 879 taxpayers (the response rate is six percent). We collaborated with an Indonesia-based research company (PT. Kresna Abadi Dinamika (KAD)) to conduct the interviews in our survey. About 86 percent of respondents did not complete the survey, and about 8 percent of respondents simply refused to take part in the survey. In the survey, we also asked for additional information about respondents' demographics and socio-economic status, such as age, gender, income, ethnicity, religion, educational level, and employment status.

2.4.2 Results

Table 2.2 presents the results of the univariate analysis of the list experiment. We found a statistically significant difference between the treatment and control groups in their responses at the 5 percent level. In the spirit of transparency, we provided information about the randomization. We checked the effectiveness of randomization by conducting a balance test. We employed logistic regression analysis to estimate the effect of various covariates on the likelihood of being in the treatment group. The results are shown in Table A2.1. Only gender has a coefficient that is significantly different from zero (p=0.1). This means that *males* were more likely to be assigned to the treatment group unintentionally. The results show that 13.42 percent of taxpayers have reported lower income than their actual income to the tax office. The issue of whether our sample accurately

represents the target population of taxpayers is obviously a crucial concern. To clarify this, we compared our sample with the target population of taxpayers in the list of taxpayers, which was obtained from the Indonesian tax office, and confirmed that our sample is consistent with the target population in terms of at least two categories: employment status and tax payment history. Regarding the employment status category, the proportion of taxpayers in our sample who are employees is 67 percent, and that in the target population is 64 percent. Regarding the tax payment history category, the proportion of taxpayers in our sample who had paid taxes in the last five years is 12 percent, and that in the target population is 11 percent. These comparisons show the similarity between our sample and the target population in terms of these two categories. Since the list of taxpayers provided by the Indonesian tax office does not include reliable information on other categories, such as age, gender, ethnicity, religion, and education, we could not confirm whether or not our sample is consistent with the target population in terms of these other categories. While we recognize that this latter issue is problematic, the consistency in terms of the two key categories mentioned at least partially justifies our claim that our sample is representative of the target population of taxpayers; this significantly mitigates the possibility of sample bias, and we feel confident that our results are valid. Concerning individual characteristics, our univariate analysis indicates several results. First, attitudes toward tax compliance differ across generations. Older people tend to exhibit lower tax compliance behavior, with 31.3 percent of respondents

Table 2.2 Difference-in-means results by various sub-groups

Variable	No of obs.	Control	Treatment	Difference
All respondents	879	1.653	1.787	13.42%**
		(0.053)	(0.056)	(0.077)
Age				
<30 years old	421	1.717	1.713	-0.40%
		(0.074)	(0.072)	(0.104)
Between 30 and 40	208	1.626	1.780	15.36%
		(0.115)	(0.111)	(0.160)
Between 40 and 50	134	1.639	1.952	31.27%*
		(0.136)	(0.160)	(0.209)
> 50 years old	116	1.484	1.889	40.50%*
		(0.145)	(0.202)	(0.245)
Gender				
Female	312	1.457	1.511	5.41%
		(0.076)	(0.088)	(0.116)
Male	567	1.774	1.920	14.59%*
		(0.070)	(0.071)	(0.099)
Income				
<4.5 mill	373	1.378	1.617	23.84%**
		(0.078)	(0.089)	(0.118)
between 4.5 mill and 15 mill	421	1.905	1.925	1.92%
		(0.075)	(0.079)	(0.109)
> 15 mill	85	1.568	1.854	28.66%
		(0.167)	(0.174)	(0.246)
Ethnicity				
Jawa	339	1.727	1.577	-15.06%
		(0.084)	(0.079)	(0.116)
Sunda	106	1.104	1.810	70.62%***
		(0.131)	(0.185)	(0.235)
Betawi	197	1.600	1.908	30.80%**
		(0.107)	(0.133)	(0.169)
	237	1.814	1.975	16.12%
Other ethnic groups		(0.105)	(0.104)	(0.148)
Religion				
Islam	680	1.572	1.703	13.11%*
		(0.059)	(0.066)	(0.088)
Other religious groups	199	1.939	2.060	12.06%
		(0.112)	(0.103)	(0.152)

Table 2.2 Continued

Variable	No of obs.	Control	Treatment	Difference
Education				
	365	1.505	1.585	7.96%
High school or below		(0.083)	(0.094)	(0.125)
College	514	1.764	1.922	15.83%**
		(0.067)	(0.068)	(0.096)
Employment status				
Employee	591	1.662	1.842	18.03%**
		(0.062)	(0.066)	(0.091)
Self-employed	172	1.864	1.786	-7.79%
		(0.128)	(0.128)	(0.181)
Unemployed	116	1.323	1.471	14.75%
		(0.139)	(0.184)	(0.226)
Perception of corruption				
Low	196	1.663	1.707	4.31%
		(0.117)	(0.124)	(0.171)
Medium	347	1.634	1.738	10.41%
		(0.080)	(0.088)	(0.119)
High	336	1.665	1.883	21.87%**
		(0.086)	(0.091)	(0.125)
Payment status				
With payment	110	1.879	2.269	38.99%**
		(0.160)	(0.167)	(0.231)
Without payment	769	1.619	1.720	10.07%
		(0.055)	(0.059)	(0.081)

Notes: Standard errors are in parentheses.
***p<0.01, **p<0.05, *p<0.10.

aged 40 to 50 years and 40.5 percent of respondents aged 50 or above having engaged in tax evasion. These results are consistent with the findings of Russo (2013) in Italy that people aged 60 or above exhibit low compliance behavior, partly due to their dissatisfaction with public services. Second, tax compliance behavior also differs between men and women, with 14.6 percent of male respondents having engaged in tax evasion, while only 5.41 percent of female respondents did so. Men tend to exhibit lower compliance than women, as suggested in multiple studies, including Barber and Odean (2001), Batrancea et al. (2019), Brockmann et al. (2016), and Hofmann et al. (2017). Third, low-income respondents tend to engage in tax evasion. Among respondents whose income was below 4.5 million rupiahs, 23.8 percent underreported their income on their tax returns. One possible reason may be that low-income people can more easily cheat on their taxes because they suffer financially more than rich people do (Hofmann et al., 2017).

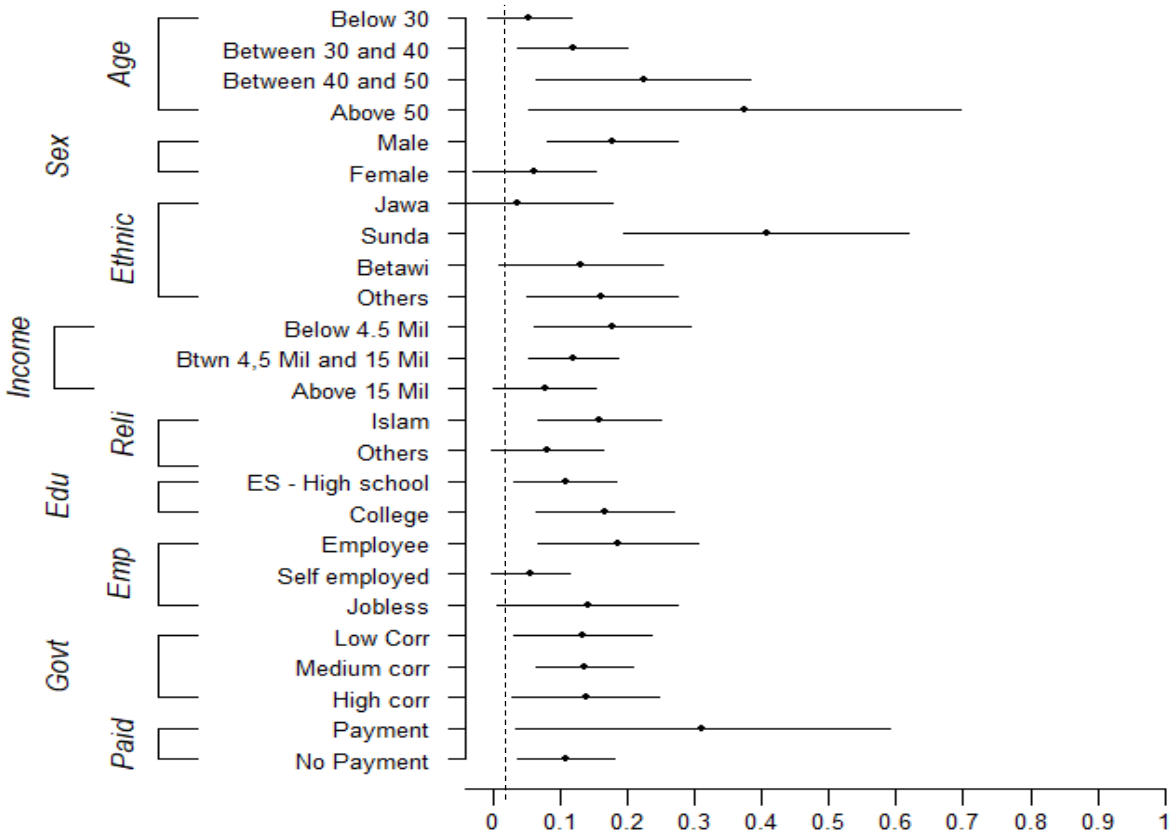
Fourth, a significant negative correlation exists between educational attainment and tax compliance behavior. Among respondents with college education, 15.8 percent disclosed that they had cheated on their taxes. These people may be able to utilize their knowledge to minimize or avoid their tax liability (Hofmann et.al., 2017). Fifth, 18.0 percent of employees who were working in private and public organizations engaged in tax evasion. Employees are generally under the tax withholding system in which their tax is deducted from their salaries. Our results imply that some employees have additional income from other sources, but they do not report it to the tax office. Sixth, we examined the roles of respondents' culture and *religion*, since they are expected to be correlated to tax compliance behavior (Kountouris & Remoundou, 2013; Lago-Penas & Lago-Penas, 2010; Russo, 2013). Specifically, we considered four ethnic groups (*Jawa, Sunda, Betawi*, and a category specified as "*other ethnic groups*" in the survey) and two religious groups (*Islam* and a category specified as "*other religious groups*"). We categorize minority ethnic and religious groups as "*other ethnic groups*" and "*other religious groups*", respectively. The results show that Sundanese and Muslims tend to engage in low tax compliance behavior.

Seventh, Kirchler et al. (2008) and Torgler (2007) examine the effects of people's trust in government on their tax compliance behavior, because the perception of corruption in government institutions discourages them from paying tax. Consistent with these studies, our analysis reveals that respondents who perceive a higher level of corruption in government (i.e., they have lower levels of trust in government) are more likely to cheat on their income tax. Finally, our survey sample was drawn from the population of those who have filed tax returns at least once in the past five years. This implies that it includes people who have no actual income to report on their tax returns and those who have never had an opportunity to cheat on their tax reports due to tax withholding by their employers. These people are less likely to select the sensitive item indicating tax evasion in their responses to our list experiment question. The results show that only 10.1 percent of people revealed that they have engaged in tax evasion among those who have no tax payments on their reports, while among those who have paid some amount of tax at least once in the past five years (not through the withholding scheme but directly to the tax office), 39.0 percent of people have engaged in non-compliance.

2.4.3 Multivariate analysis

The univariate analysis captures the difference-in-means for each group separately without considering overlap in the group memberships. This analysis uses data inefficiently. To overcome these issues, we conduct a multivariate analysis, which basically generalizes the difference-in means approach by modeling the joint distribution efficiently to allow for control for multiple variables concurrently. We apply maximum likelihood models with the constrained version of the estimator, assuming that the addition of the sensitive item does not influence the

Figure 2.1 Multivariate estimates of tax non-compliance.



Notes: The dots estimated proportions of respondents engage in tax non-compliance, and the lines show the 95% confidence intervals from the regression model in Table A2. The vertical axis shows respondents' attributes.

answers concerning the control items (Blair & Imai, 2012; Imai, 2011). We used statistical method for the item count technique and list experiment that can be found at http://CRAN.R-project.org/package=list. (Blair et al., 2018). We also checked for the existence of floor and ceiling effects as a result of our design, following Blair and Imai (2012). Figure A2.1 presents the percentage of respondents for each possible answer. The results show that the responses are distributed normally. The extreme cases have relatively few responses in both the control group and the treatment group. Blair and Imai (2012) proposed a test to detect the existence of a design effect in which the addition of the one treatment statement would affect the answers to the control items. Our test result shows that the Bonferroni-corrected *p*-value is 1.000. Therefore, we cannot reject the null hypothesis that there is no design effect. The estimated coefficients together with standard errors are shown in Table A2.2. We use several individual characteristics in the model. To measure the variables, we reconstruct the data as follows: *age* (*below 30*=1; *between 30 and 40*=2; *between 40 and 50*=3; *above50*=4), *gender* (*male*=1; *female*=0), *ethnic* groups [*Jawa* (*Jawa*=1; non-Jawa =0), *Sunda* (*Sunda*=1; non-Sunda =0), *Betawi* (*Betawi*=1; non-Betawi =0)], *income* (*below 4.5 mil*=1; *between 4.5 mil and 15 mil*=2; *above 15 mil*=3), *religion* (*Islam*=1; *other religious groups* =0), *education* (*elementary school-high school*=1; *college*=2), *employment status* [*employee* (*employee*=1; non-employee =0), *self-employed* (*self-employed*=1; non-self-employed =0)], and *perception of corruption* (*low corruption*=1; *medium corruption*=2; *high corruption*=3).

Figure 2.1 illustrates the estimated proportions of respondents cheating on their taxes by reporting less income than they actually earned. The coefficients for several variables are consistent with the findings in our univariate analysis discussed in the previous subsection. First, we continue to find a tendency that older people, especially respondents in the age group between 40 and 50 years old, engage in tax evasion more than do those in the age group below 30 years old. The difference between these age groups is statistically significant at the 5 percent level. Second, our multivariate findings on gender are consistent with our univariate findings. Men engage more

in tax evasion than women do, with an estimated difference of 11.6 percentage points, which is marginally significant at the 10 percent level. Third, there are significant differences between ethnic groups in tax evasion. The proportion of Sundanese engaging in tax evasion is higher than those of *Jawa* and *Betawi* respondents, with estimated differences of 36.9 and 27.5 percentage points, respectively. These differences are statistically significant at the 5 percent level. Fourth, we also find that employees engage in more tax evasion than self-employed individuals do, with an estimated difference of 12.9 percentage points. It is also statistically significant at the 5 percent level.

On the other hand, some results in the multivariate analysis are less clear compared to those in the univariate results. The univariate analysis suggests that the group of respondents with income below 4.5 million rupiahs engage in more tax evasion than the group of higher income respondents. However, the estimated differences across income levels disappear in the multivariate results. In addition, while the univariate analysis also shows that Muslims and people with college education or higher tend to engage more frequently in tax evasion, the multivariate results indicate no clear evidence of differences across religious groups or education levels. Moreover, the univariate analysis shows that people with a perception of high corruption tend to engage more frequently in tax evasion, but the multivariate analysis does not confirm that tax evasion behavior depends on the perception of corruption. Furthermore, the univariate analysis shows that people who have paid some amount of tax directly to the tax office at least once in the past five years tend to engage more frequently in tax evasion than do those who have never done so, but the difference between the two groups is not statistically significant in the multivariate analysis, partly due to the small sample size of the former group of people.

2.5 Conclusion

Tax evasion is a sensitive problem at the individual level. Since taxpayers have a motivation to hide their tax evasion behavior, identifying their true behavior can be a crucial challenge for researchers as well as tax regulators. This is related to social desirability bias, where respondents attempt to answer survey questions in a socially desirable or acceptable manner, instead of revealing their actual opinions or behavior. In the context of taxation, this bias emerges when taxpayers pretend to meet their own obligations by underreporting their incomes to the tax office. To identify the characteristics of taxpayers who engage in tax evasion behavior, this study mitigated the influence of social desirability bias by conducting a list experiment in Jakarta, Indonesia. The univariate analysis revealed that 13.4 percent of taxpayers have cheated on their taxes by underreporting their income on their tax returns. The results also uncovered clear evidence that tax evasion behavior varies depending on individual characteristics, such as age, gender, ethnicity, and employment status. The multivariate analysis generally confirmed the findings from the univariate analysis, though some differences found in the univariate analysis (such as those between religious groups and education levels) disappeared in the multivariate analysis.

In a developing country like Indonesia, the percentage of taxpayers who actually cheated on their taxes may be larger than estimated in this study because of weak auditing capacity and legal system.

Our list experiment outcomes may still underestimate the proportion of taxpayers who have engaged in tax evasion behavior. In a developing country like Indonesia, the percentage of taxpayers who actually cheated on their taxes could be larger than estimated in this study because of weak auditing capacity and legal system. However, we believe that our study has important implications for taxation policy because our results help identify potential targets for tax auditing to overcome the issue of a government's limited institutional capacities. For instance, in Indonesia, tax offices identify potential targets of auditing mostly on an ad hoc, not a systematic, manner by

merely comparing a particular tax return to others from a similar business environment. Since such an ad hoc monitoring scheme does not take into account the characteristics of individual taxpayers, tax offices are likely to fail to detect many taxpayers engaging in tax evasion behavior.

The Indonesia State Budget 2019 emphasizes that the tax authority (DGT) needs to raise tax revenue by broadening the tax bases and also by improving tax compliance sustainability. The Minister of Finance points out the importance of effective tax auditing to increase tax revenue to the required level for supporting the country's development which was delivered to the parliament on July 27, 2017. It is important for tax offices to identify what types of taxpayers are more likely to engage in tax evasion and to establish appropriate measures to tackle tax evasion through tax auditing. Given that our results indicate that taxpayers who are old, male, corporate employees, and members of a certain ethnic group tend to exhibit relatively low tax compliance, one possible tax policy could be for the DGT to cluster these groups of taxpayers as potential targets for tax auditing. However, the DGT currently does not have all the necessary information on individual taxpayers due to constraints on its taxpayer database and administrative capacities. To address this practical limitation, the DGT needs to collect the necessary information on individual taxpayers by changing its taxpayer database structure and administrative management while at the same time carefully protecting taxpayers' privacy.

We believe that the relationship between tax evasion and individual characteristics found in our study would be useful information for both researchers and tax authorities who are interested in designing effective tax policies and auditing schemes to improve governance and revenue collection. At the same time, the ethical issues involved in targeting specific groups in the tax auditing process are also a matter of concern. The government and tax authorities need to be aware of these and set clear rules for the implementation of auditing and the appropriate handling of personal data.

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APPENDIX

Table A2.1 Logit model test of balance in randomization

Variable	Coefficient	S.E.
Age	-0.027	0.075
Male	0.260*	0.149
Jawa	-0.065	0.180
Sunda	0.248	0.247
Betawi	-0.202	0.202
Income	0.032	0.119
Islam	-0.087	0.181
Education	0.098	0.155
Employee	0.078	0.244
Self-employed	0.034	0.266
Government	0.011	0.090
Payment	-0.110	0.224
Constant	-0.343	0.479
Log-likelihood	-604.619	
Chi-squared	8.60	
No of obs.	879.000	

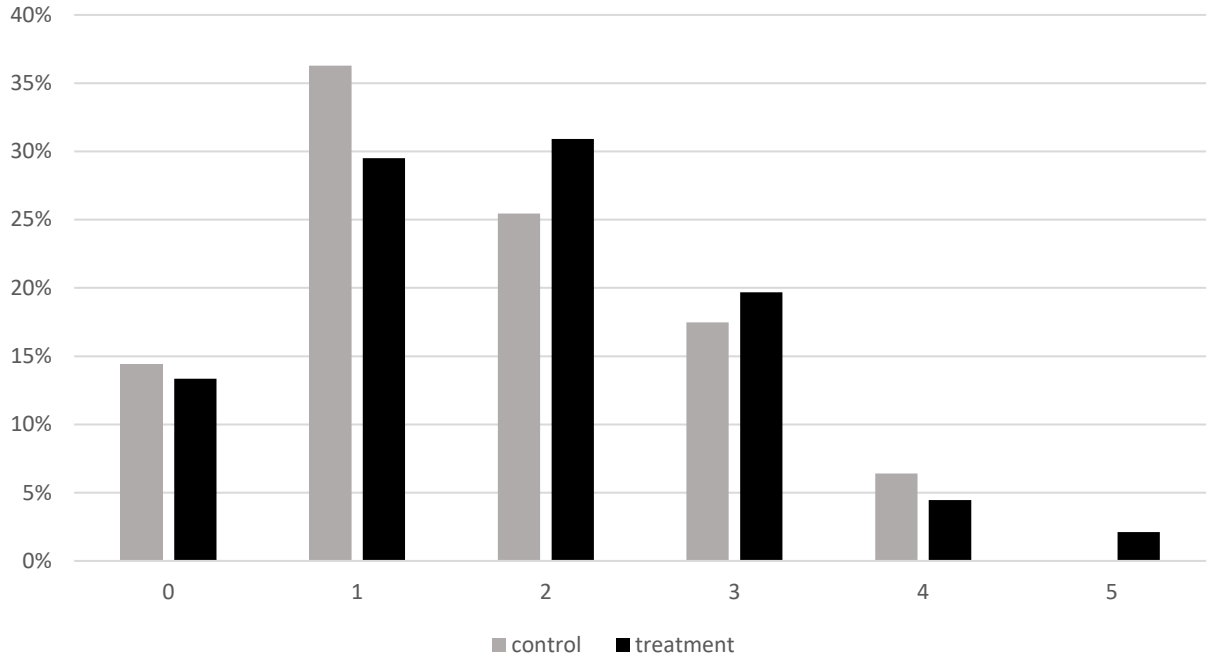
Notes: The dependent variable is the indicator of whether the respondent was assigned to the treatment group.
*p<0.1, **p<0.05, **p<0.01.

Table A2.2 Multivariate regression results (maximum likelihood constrained model)

	Est.	S.E.		Est.	S.E.
Sensitive item			Control items		
(Intercept)	-7.401	3.068	(Intercept)	-0.935	0.247
Age	1.157	0.512	Age	-0.052	0.043
Male	1.895	1.316	Male	0.290	0.081
Jawa	-2.199	2.510	Jawa	-0.031	0.099
Sunda	1.952	0.983	Sunda	-0.416	0.143
Betawi	-0.369	1.011	Betawi	0.017	0.110
Income	-0.795	0.614	Income	0.132	0.064
Islam	1.269	1.056	Islam	-0.247	0.096
Education	0.882	0.821	Education	0.148	0.085
Employee	0.595	1.328	Employee	0.199	0.138
Self-employed	-1.750	1.502	Self-employed	0.252	0.145
Government	0.028	0.566	Government	0.033	0.049
Payment	2.183	1.296	Payment	0.161	0.124
Log-likelihood	-1293.46				

Notes: The outcome variable is whether a respondent reports income lower than actual one.

Figure A2.1 Percentage of respondents for each answer category in the list experiment.



Note: Respondents were asked to report the number of statements that apply to them in the range of zero to four (in the case of control group shown in gray) or zero to five (in the case of treatment group shown in black).

Chapter 3

When do people become more willing to pay taxes? The effects of government spending information on the public's willingness to pay taxes

3.1 Introduction

Governments coordinate people's various interests through budget allocations for the provision of public goods and services. In order for the government to maintain its budgetary power, securing revenues and ensuring people's willingness to pay are important. Citizens generally expect excellent performance from their governments, including high-quality public goods and services. Rational budget allocation is considered to be one of the key factors that increase trust in government and influence citizens' attitudes toward tax payment (Alm et al., 2006). Citizens are said to show willingness to pay taxes when they can identify high government spending performance in areas they are comfortable with (Alm et al., 1993; Glaser & Hildreth, 1999). In our study, we conducted a survey experiment in Jakarta, Indonesia, to examine what kind of information about government spending actually influences people's willingness to pay taxes.

Reciprocity, a tax payment morale, shapes people's taxation awareness, including their willingness to pay taxes. Although the willingness to pay taxes shares similar features particularly with voluntary tax compliance (Torgler, 2007), it can differ from tax compliance. We can easily consider a scenario where individuals would be willing to pay more taxes if the spending were for projects that they truly support, but they would continue to commit tax evasion as much possible. In reciprocity, people's attitudes are affected by the interaction between the government and taxpayers through budget allocation. People's perception of fairness between the amount of tax paid and the amount of benefits received depends on their satisfaction with the budget allocation. Accountability may also improve their perception of an exchange of fairness between their contributions and the services they receive. Furthermore, if the government were to respond

appropriately to taxpayers' preferences, it would enhance their attitudes toward taxes (Alm & Torgler, 2006). This mechanism increases cooperative behaviors on their tax obligations (Leder et al., 2010). On the other hand, the unfairness of fiscal exchanges could discourage taxpayers from being cooperative. This reciprocal relationship involves an emotional tie within the framework of a contract between the government and the citizens (Barone & Mocetti, 2011).

Sound taxation, which represents the state's ability to finance necessary public expenditures, is likely to promote a social contract between the state and its citizens, which in turn is likely to increase revenues (Martin & Prasad, 2014). In this regard, a number of studies have explored the importance of information on the budget allocations for public expenditures in shaping people's tax attitudes, including their willingness to pay taxes and tax compliance (Alm et al., 1993; Alm et al.,2006; Barone & Mocetti, 2011; Casal et al., 2016; Doerrenberg, 2015; Glaser & Hildreth, 1999; Leder et al., 2010). Glaser and Hildreth (1999) have demonstrated that there is a link between the performance of governments, the public services they provide to citizens, and citizens' willingness to pay.

Our study has the following distinctive features from previous literature: First, most studies have covered the link between the types of public goods and services to tax compliance, having examined cases from developed countries (Alm et al., 1993; Casal et al., 2016; Doerrenberg, 2015; Glaser & Hildreth, 1999; Lamberton et al., 2017; Robbins & Kiser, 2018). However, there is still a lack of empirical evidence for the issue of willingness to pay taxes in developing countries. Developing countries generally suffer from tax evasion more than developed countries (Crivelli et al., 2016). Due to limitations on tax enforcement under weak institutional frameworks, tax revenue in developing countries relies more on cooperation from taxpayers. Empirical studies on this issue are needed in developing countries. Second, most existing studies on the identification of taxpayers' preferences rely on laboratory experiments (Alm et al., 1993; Casal et al., 2016; Doerrenberg, 2015; Lamberton et al., 2017) or traditional surveys (Ali et al., 2014). However, the observed

attitudes of respondents in a laboratory experiment may not reflect their actual decisions, since they are aware of the artificial setting of the experiment (Mascagni, 2018). A traditional survey also faces a similar problem in which the revealed attitudes inaccurately portray actual behaviors because of the sensitivity of the tax compliance issue (Torgler, 2007).

A vignette experiment enables us to overcome these problems by randomly exposing respondents drawn from a sample of taxpayers to a short story consisting of several characteristics of the actor mimicking real-life situations (Dulmer, 2007). Since the respondents do not realize the aspects and conditions that are of interest in the research, this design avoids social desirability bias problems on sensitive issues (Steiner et al., 2016). The vignette experiment has been used to identify human choices and preferences in various fields, such as sociology, political science, and medical science (Breeschoten et al., 2018; Kootstra, 2016; Ung et al., 2017). Moreover, vignette experiments have high internal and external validities, which are a combination of the advantages of laboratory experiments and traditional surveys (Gross et al., 2017). High internal validity can be achieved by using multidimensional variables and a combination of several experiment techniques, while high external validity can be achieved by incorporating heterogeneous respondents (Auspurg & Hinz, 2015; Mutz, 2011). The vignette technique allows us to identify the causal effect of conditional factors, such as the types of public goods and services and taxpayers' characteristics, on taxpayers' attitudes. To the best of our knowledge, this study is the first attempt at evaluating the effect of information on the types of public spending on people's willingness to pay taxes, in the framework of a vignette experiment in a developing country. Few studies have conducted vignette experiments in the field of taxation. An exception may include the works of Abraham et al. (2018) and Gross et al. (2017), which focused on inheritance tax, Bornmann and Stack (2015) on the relationships between reward and tax compliance, and Kwok and Yip (2018) on tax education. Meanwhile, Robbins and Kiser (2018) used a vignette experiment to evaluate the relationship between the types of public spending and tax compliance in a developed country.

In the context of transparency and accountability, taxpayers pay attention to government policies, including the allocation of the budget intended for public spending into various sectors. In the case of Indonesia, the government's primary targets include, but are not limited to, the improvement of socio-economic infrastructure and human resources, such as education and healthcare. The budget being allocated into these sectors tends to be accepted by the public because they meet the basic needs of people and provide them with equal benefits. In contrast, some portions of public spending are allocated to specific people and groups who do not receive equal benefits from it. For example, the Indonesian government has recently given tax allowances and loan interest subsidies to some large-scale firms in specific industrial sectors. The subsidy policy in Indonesia State Budget 2019 targets only a small portion of industries which include geothermal, fuel, and electricity sectors (Directorate General of Budget, 2018). Although this type of subsidy can be justified for various economic reasons, it often triggers a lot of public debate about the rationality of budget allocations because of the small coverage of beneficiaries receiving unequal benefits. Thus, we examine how taxpayers' willingness to pay taxes varies by information provision on budget allocation into three areas of important public spending: (i) infrastructure, (ii) healthcare, and (iii) industrial subsidy. Article 31 of the 4th amendment of the Constitution of the Republic of Indonesia of 1945 specifically states that a fixed portion of 20% of the government budget is spent for education. Thus, we do not include this sector in this research, since we assume that most taxpayers know the purpose and the portion of public spending allocated for the education sector.

We conducted a vignette experiment through a computer-assisted telephone interviewing (CATI) survey from January to March 2019, where the respondents were taxpayers who filed income tax returns in the Jatinegara District of the Jakarta Province. We recruited survey respondents in collaboration with the tax authority, the Directorate General of Taxes (DGT) of the Indonesian government, and obtained responses from a total of 879 taxpayers. To give a preview

of the results of our experiment, the willingness of taxpayers to pay taxes was reduced when they were exposed to information that the government allocates a significant portion of its budget as subsidies for large firms. Respondents were less sensitive to the exposure of information about the allocation of government budget into healthcare and infrastructure development. These results have important policy implications for taxation. Industrial subsidies are widely recognized as an important tool for economic growth, but at the same time they provide unequal benefits to each individual and have a negative impact on their willingness to pay taxes. In the next section, we discuss our research design and data in more detail.

3.2 The vignette experiment

We drew our sample from the list of taxpayers administered by the tax office covering the Jatinegara subdistrict of the East Jakarta district in Jakarta province. We obtained the approval of the Head Office of the Jatinegara Tax Office. We draw our sample from Jakarta province, which plays an important role in Indonesia particularly because this province is regarded as the center of the economy. Being the capital of Indonesia, this province contributed 66% of national tax revenue in 2019 and 17% of total GDP in 2017. In this study, we set our target in the East Jakarta region. This is one of five regions of Jakarta province, and it covers 27% of the whole population in Jakarta province. To make sure that our sample can represent people in this province, we compare the characteristics of people living in this region with those in the entire Jakarta province. Regarding age, the proportion of people under 35 years old is 36% in the East Jakarta region and 40% in the whole of Jakarta province. In terms of gender, the proportion of males is 51% in the East Jakarta region and 50% in the whole of Jakarta province. Although it is impossible to compare other attributes due to the lack of data, we can conclude that, at least for age and gender, the East Jakarta region shares similar distribution to the whole of Jakarta province. Based on these arguments, we believe that our sample from the East Jakarta region can represent the population of taxpayers in

the whole Jakarta province. From a total of 121,330 individual taxpayers on the list, we identified 14,428 individuals who filed tax returns from 2013 to 2017. We excluded non-effective taxpayers, non-filing taxpayers, and taxpayers without information of their phone numbers. Non-effective taxpayers are taxpayers who do not need to report their tax returns nor pay taxes. Non-filing taxpayers are those who never reported tax returns in the past two years sequentially. We administered the CATI survey from January through March 2019 and obtained a total of 879 complete responses. We collaborated with an Indonesia-based research company to conduct a computer-assisted telephone interviewing (CATI) survey. The response rate is around 6%. Such a low response rate raises concerns about whether the respondents are representative of the taxpayers population. To clarify this concern, we checked to see if the attributes of our 879 respondents differed from those of 14,428 taxpayers in the targeted district who were selected and invited to participate in our survey. We confirm that the invited taxpayers share similar characteristics to the actual respondents in two categories: the employment status and that tax payment history. First, regarding the employment status, 64% of the invited taxpayers are employees and 67% of the actual respondents are also employees. Second, regarding tax payment history of 11%, the invited taxpayers have a record of paying tax for the past five years, and the same was true for 12% of actual respondents. Because the list of taxpayers did not include reliable information on other categories, we could not verify whether our sample was representative of taxpayers in other categories. However, we can expect that employment status and tax payment history are also correlated with taxpayer attributes such as gender and annual income. Therefore, while we acknowledge the limitations, we believe the consistency in two categories can partially justify the claim that our sample is representative of the invited taxpayers.

We aim to explore how the extent to which taxpayers are willing to pay taxes changes depending on the perceived fairness between their contributions and the benefits they receive. To do so, our survey includes a vignette about the targeted sectors of government spending. There are

three treatment groups that provide respondents with information about any of the sectors that public spending targets: (i) infrastructure, (ii) healthcare, and (iii) industrial subsidy. There is also one control group that does not expose any information about government spending. We randomly assigned our respondents to either one of the four groups (one control group and three treatment groups) and asked questions about their willingness to pay taxes. The exact wording of our vignette experiment is shown in Figure 3.1. The procedure of random assignment was programmed using Qualtrics in such a way that all the respondents were equally divided among the groups, to avoid violating the assumption of independent observations (see Dickel & Graeff, 2018; Gross et al., 2017). To confirm the effectiveness of the randomization, we conducted a balance test by applying the logit regression with the random assignment of treatment as the dependent variable. The results generally show no significance for most variables, except the income variable for the infrastructure group (Table 3.1), which verifies the successful randomization of our variables across groups.

Figure 3.1 Vignette example in the treatment group

The government is currently spending 20% of taxpayers' money **on infrastructure such as highways, bridges, and subways/on healthcare such as hospital and health insurance/on industrial subsidies such as tax holiday and special loan with low-interest rate to large corporations.**

How much are you willing to pay taxes?

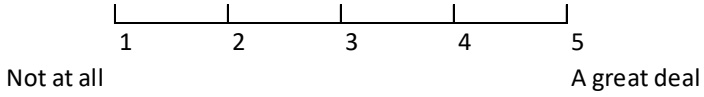


Table 3.1 Balance test of randomization

	Infrastructure vs control		Healthcare vs control		Industrial subsidy vs control	
	Coef	S.E	Coef	S.E	Coef	S.E
Age	0.03	0.21	-0.13	0.22	0.05	0.22
Male	-0.18	0.21	0.27	0.21	0.10	0.21
Income	0.48**	0.22	0.05	0.22	0.02	0.22
Major ethnic	0.07	0.20	0.29	0.20	0.25	0.21
Islam	0.28	0.24	0.22	0.24	0.36	0.25
Education	-0.37*	0.22	0.10	0.21	0.08	0.22
Employee	-0.33	0.33	-0.19	0.34	-0.38	0.33
Self-employed	-0.05	0.37	0.08	0.38	0.13	0.37
Cons	-0.01	0.41	-0.43	0.41	-0.34	0.43
Log likelihood	-297.78		-303.57		-300.82	

Notes: Dependent variable is a binary indicator which equals one if a respondent is assigned to each treatment group.
***p<.01, **p<.05, *p<.1

3.3 Results and discussion

The willingness to pay taxes was measured using a Likert scale ranging from 1 (not at all) to 5 (a great deal). Table 3.2 shows the summary statistics of our data. The mean of the Likert scale answer for respondents in the control group is 3.20, while those in the three treatment groups (infrastructure, healthcare, and industrial subsidy) are 3.14, 3.27, and 2.82, respectively. It appears that the mean of the answer in the industrial subsidy group is the smallest among other groups. We applied the difference-in-means to confirm whether the differences between groups are statistically significant.

We first examined the difference-in-means in our respondents' willingness to pay taxes between the treatment and control groups. The results shown in Table 3.3 indicate that the sector of public spending targets described in our vignette affected the extent to which our respondents were willing to pay taxes. The difference-in-means between the industrial subsidy and control groups is the largest in terms of the magnitude (-0.38 point, $p<0.01$) among other treatment groups. This suggests that the exposure to the information about industrial subsidies decreases the Likert scale measure of respondents' willingness to pay taxes by 0.38 points. Since the standard deviation of the Likert scale measure is 1.05 (shown in Table 2), the size of this effect is approximately one-third of the standard deviation, which is large enough to claim that it is substantively significant and meaningful. Meanwhile, exposing the information about government spending on infrastructure and healthcare sectors does not appear to influence our respondents' willingness to pay taxes.

Our results imply that taxpayers tend to view industrial subsidies negatively, which makes them less willing to pay their taxes. Since industrial subsidies mostly target specific industries, taxpayers would likely assume that they only benefit large-scale corporations, rather than relatively small businesses. Such a negative perception of unfair treatment would reduce the motivation to pay tax among taxpayers. Given the conventional argument that industrial policies help promote a

country's economic growth through various channels, particularly in developing countries, our finding suggests that industrial subsidies may have negative side effects in terms of the reduction in the willingness to pay taxes. Hence, the government should be cautious of policies targeting specific groups. In contrast, public spending on infrastructure and healthcare is likely to be widely accepted among the public because it usually benefits a large population in the country. Thus, such policies do not seem to discourage taxpayers' motivation to pay their taxes.

Table 3.2 Distribution of respondents and answers among groups

		Full sample			Control			Infrastructure			Healthcare			Industrial subsidy		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
All		879	3.11	1.05	220	3.20	1.07	217	3.14	1.00	222	3.27	0.99	220	2.82	1.09
Age																
	<=35	516	3.10	1.01	132	3.16	1.07	123	3.12	0.94	137	3.23	0.94	124	2.87	1.05
	> 35	363	3.12	1.11	88	3.26	1.07	94	3.16	1.07	85	3.33	1.07	96	2.76	1.15
Gender																
	Female	312	3.04	1.04	80	3.08	1.09	87	3.15	0.98	69	3.25	0.85	76	2.68	1.12
	Male	567	3.14	1.06	140	3.27	1.05	130	3.13	1.01	153	3.27	1.05	144	2.90	1.08
Income																
	< 4.5 million	373	2.99	1.07	95	3.20	1.01	82	2.89	1.11	96	3.19	0.98	100	2.68	1.09
	> 4.5 million	506	3.19	1.03	125	3.20	1.11	135	3.29	0.89	126	3.33	1.00	120	2.94	1.09
Ethnic																
	Major	536	3.11	1.01	126	3.21	0.98	130	3.11	1.01	142	3.25	0.97	138	2.87	1.05
	Minor	343	3.10	1.11	94	3.18	1.18	87	3.18	0.98	80	3.29	1.03	82	2.74	1.17
Religion																
	Islam	680	3.06	1.04	162	3.09	1.04	170	3.07	1.04	173	3.25	0.98	175	2.84	1.08
	Others	199	3.26	1.07	58	3.50	1.10	47	3.38	0.80	49	3.31	1.04	45	2.76	1.17
Education																
	ES- High School	365	3.05	1.02	86	3.29	0.99	101	3.00	0.98	86	3.13	1.05	92	2.80	1.02
	College	514	3.15	1.07	134	3.14	1.11	116	3.26	1.00	136	3.35	0.95	128	2.84	1.15
Employment																
	Employee	591	3.13	1.02	157	3.23	1.01	142	3.21	1.00	154	3.19	0.97	138	2.85	1.07
	Self Employed	172	3.17	1.13	37	3.32	1.20	43	2.91	1.02	42	3.52	1.11	50	3.00	1.11
	Unemployed	116	2.91	1.08	26	2.85	1.19	32	3.13	0.94	26	3.31	0.88	32	2.44	1.11

Note: Demographic of respondents with the number of respondents in subgroups, mean, and standard deviation

Table 3.3 indicates that the difference-in-means between the industrial subsidy group and control group are statistically discernible from zero for all the subgroups of respondents, except for those who are self-employed or unemployed. All respondents were similarly less willing to pay taxes when exposed to information about the government programs to disburse industrial subsidies. Using the results in the third column of Table 3.3, we draw Figure A3.1 which shows the estimated difference-in-means and their confidence intervals for each subgroup of respondents. The figure suggests that the industrial subsidy treatment makes non-Muslim respondents much less willing to pay taxes than Muslim respondents. One possible reason for this is that non-Muslims may believe that the Indonesian government's policies are unfair and favor Muslims. However, we find no significant heterogeneity of treatment effect outside of these groups. While a detailed discussion of within-group variation in attitudes toward different types of public spending is not the main focus of our manuscript, we conducted multivariate regression analysis to see whether the negative effect of industrial subsidies on willingness to pay taxes is larger for non-Muslims. To do so, we estimated a model with an interaction term between the industrial subsidy treatment variable and the respondents' religion variable (1 for Muslims and 0 for others). The results show that the interaction term's coefficient is positive and statistically significant, suggesting that the negative effect of industrial subsidies on willingness to pay taxes is more substantial for non-Muslims.

Table 3.3 The difference-in-means between the treatment groups and the control group

Variable		Infrastructure	Healthcare	Industrial subsidy
		Diff to Control	Diff to Control	Diff to Control
all respondents		-0.062	0.066	-0.377***
		(0.099)	(0.098)	(0.103)
Age	<=35	-0.037	0.067	-0.288**
		(0.126)	(0.123)	(0.133)
	> 35	-0.102	0.068	-0.501***
		(0.159)	(0.163)	(0.164)
Gender	female	0.074	0.171	-0.391**
		(0.160)	(0.162)	(0.177)
	male	-0.141	0.003	-0.376***
		(0.125)	(0.123)	(0.126)
Income	<4.5 mill	-0.310*	-0.013	-0.520***
		(0.159)	(0.143)	(0.150)
	> 4.5 mill	0.089	0.125	-0.258*
		(0.125)	(0.134)	(0.141)
Ethnic	Major ethnic	-0.107	0.039	-0.345***
		(0.124)	(0.119)	(0.125)
	Minor ethnic	0.003	0.107	-0.437**
		(0.162)	(0.170)	(0.178)
Religion	Islam	-0.022	0.162	-0.253**
		(0.114)	(0.110)	(0.115)
	Others	-0.117	-0.194	-0.744***
		(0.191)	(0.208)	(0.224)
Education	High school or below	-0.291**	-0.163	-0.486***
		(0.145)	(0.156)	(0.151)
	College	0.117	0.211*	-0.306**
		(0.134)	(0.126)	(0.140)
Employment status	Employee	-0.018	-0.041	-0.381***
		(0.116)	(0.112)	(0.121)
	Self employed	-0.417*	0.199	-0.324
		(0.248)	(0.260)	(0.249)
	Jobless	0.279	0.462	-0.409
		(0.280)	(0.291)	(0.302)

Notes: To analyze the individual characteristics, we manipulated the independent variables as follows: age of respondents (35 or below=0; above 35=1), gender (female=0; male=1), income (below 4.5 million=0; above 4,5 million=1), ethnic group (major ethnic (Java and Betawi)=1; minor ethnic (non-Java and non-Betawi)=0), religion (Islam=1; others =0), education (elementary school-high school=0; college=1), and employment status [[employee (employee=1; non-employee =0), self-employed (self-employed=1; non-self-employed =0)].
Standard errors are in parentheses. ***p<.01, **p<.05, *p<.1

As robustness tests for our findings of the univariate analysis, we performed multivariate analyses using an ordinary least square (OLS), ordered probit, and multinomial logit regressions, while jointly controlling for the treatment conditions and the sets of individual attributes. Because the results of all three multivariate analyses are consistent, particularly regarding the effect of each treatment on the willingness to pay taxes, we explain our results based on the OLS estimation model, while the results of the ordered probit and multinomial logit models will be shown in the appendix (Tables A3.1 and A3.2). Our whole sample is comprised of four groups: (i) control, (ii) infrastructure, (iii) healthcare, and (iv) industrial subsidy. This study applied the OLS regression over each of the following three subsamples separately. The first subsample consists of the (i) control and (ii) infrastructure groups. The second consists of the (i) control and (iii) healthcare groups. The third consists of the (i) control and (iv) industrial subsidy groups. As the second robustness check, since our five-point Likert scale variable is an ordinal variable, we applied an ordered probit regression, which is more suitable to analyze an ordinal dependent variable. As the third robustness check, we applied multinomial logit regression, where we recoded the original coding of the five-point Likert scale of the answers (1 - not at all, 5 - a great deal) into a three-categorical variable. Choices 1 and 2 in the original coding were recoded into 1 (as the baseline category), Choice 3 was recoded into 2, and Choices 4 and 5 were recoded into 3. We confirm the empirical validity of our main results that only industrial subsidy consistently reduces the willingness to pay taxes.

Table 3.4 Regression results of the impact of treatments on people's willingness to pay taxes

	Full sample (1)		Infrastructure (2)		Healthcare (3)		Industrial subsidy (4)	
	Coef	S.E	Coef	S.E	Coef	S.E	Coef	S.E
Treatment								
Infrastructure	-0.06	0.10	-0.05	0.10				
Healthcare	0.06	0.10			0.06	0.10		
Subsidy	-0.37***	0.10					-0.37***	0.10
Age	0.04	0.08	0.12	0.11	0.09	0.11	0.03	0.12
Male	0.07	0.08	0.07	0.10	0.07	0.11	0.12	0.11
Major ethnic	0.06	0.07	0.04	0.10	0.09	0.10	0.14	0.11
Income	0.14*	0.08	0.11	0.11	-0.00	0.11	0.08	0.12
Islam	-0.16*	0.09	-0.36***	0.12	-0.23*	0.12	-0.22*	0.13
Education	0.01	0.08	-0.07	0.11	0.02	0.11	-0.15	0.12
Employee	0.13	0.12	0.24	0.16	0.17	0.17	0.41**	0.18
Self-employed	0.18	0.13	0.04	0.19	0.34*	0.19	0.49**	0.19
cons	3.00***	0.16	3.161***	0.21	3.06***	0.21	2.86***	0.23
R-squared		0.043		0.04		0.02		0.07
Adj R-Squared		0.031		0.02		0.00		0.05
N		879		437		442		440

Notes: ***p<.01, **p<.05, *p<.1

The dependent variable is the Likert scale of the answers given by the respondents. The treatment condition is captured using a binary variable that equals one if a respondent is assigned to each treatment group. The setting of our experiment introduced three binary variables: *infrastructure* (infrastructure group=1, other groups=0), *healthcare* (healthcare group=1, other groups=0), and *industrial subsidy* (industrial subsidy group=1, other groups=0). Table 3.4 displays the estimated results of the models with all three binary variables (Column 1) and one binary variable at a time (Columns 2, 3, and 4). These results confirm our finding in the univariate analysis that industrial subsidies reduce people's willingness to pay taxes ($p<0.01$).

In the slippery slope framework, tax compliance can be achieved through two mechanisms: the power of the authorities, including deterring tax evasion through audits and fines, and trust in the authorities (Kirchler et al., 2008; Prinz et al., 2014). While both mechanisms are relevant in determining people's tax attitudes, our study focuses on the second mechanism—the relationship between trust in authorities and voluntary tax compliance. Based on the historical story of countries that have collected tax revenue and prospered, the first mechanism relates to the power of the authorities, which may be achieved by establishing strong tax administration capabilities to detect tax evasion; and the second mechanism relates to trust in the authorities (Bergman & Steinmo, 2018). They discuss the mechanism of how trust can develop to promote willingness to pay taxes. Trust in authorities is more likely to be generated when governments perform efficiently and effectively, forming perceptions of fairness and equity among citizens. People perceive fairness and equity when governments have the ability to provide valuable public goods and services to all citizens without discriminating against certain segments of society (Bergman & Steinmo, 2018; Steinmo, 2018).

To explore how the mechanism of public goods and services works to shape people's perception of the government, we manipulated the information given to respondents about the government's public expenditure. In our study, we provided three different types of public

spending: infrastructure, healthcare, and industrial subsidies. People are likely to perceive infrastructure and healthcare services as collective public goods and services (Lieberman, 2009). If taxpayers believe that these expenditures will benefit not only themselves but also society as a whole, they will establish trust in the authorities and be more willing to pay taxes (Bergman & Steinmo, 2018). However, our study did not find any empirical evidence to support this in Indonesia. In contrast, industrial subsidies targeting specific groups of people are more likely to be considered as a form of control of political relations, rather than as public goods and services. Because they are not public goods and services, people will be concerned about the benefits of these subsidies, especially who the beneficiaries are and whether they are beneficial to their groups (Lieberman, 2009). Such perceptions are likely to reduce taxpayers' trust in the authorities and discourage them from paying taxes (Martin et al., 2009).

Our study showed the effect of government policies, particularly those that may be perceived differently by different groups of citizens (such as industrial subsidies), on people's willingness to pay taxes compared to other policy conditions in the context of a developing country. There are specific features of developing countries, such as low transparency in budgetary information, immature tax systems, and less effective audit systems. In addition, because many people are less educated, the public may not pay much attention to information about government budgets and expenditures. Given these situations in developing countries, examining how information about public spending affects people's willingness to pay taxes would be important for central authorities who seek to increase budget transparency.

3.4 Conclusion

Implementing fiscal policies needs to be accompanied by government accountability to the public, and people are interested in the relevance and implications of these policies. Some fiscal policies that broadly benefit people tend to be supported by the public or taxpayers due to their fairness in

the reciprocity between those who contributed and those who were rewarded. This reciprocal balancing promotes a positive perception about the government's responsibility for the prosperity of the people. This fosters cooperative behavior among them, particularly through their tax payment contributions. Hence, the government needs to adequately address people's preferences to improve their motivation to pay taxes.

Given this argument, we conducted a vignette experiment with taxpayers who filed income tax returns in the Jatinegara Province of Indonesia. We designed this experiment to identify how people's willingness to pay taxes responds to information provision on the government's budget allocation into three important sectors: (i) healthcare, (ii) infrastructure, and (iii) industrial subsidy. One of the advantages our research design has over others, such as traditional surveys and laboratory experiments, is that it minimizes social desirability bias. Social desirability bias is a typical problem when examining sensitive issues, such as people's tax compliance behavior. The results of our experiment indicate that taxpayers are not as willing to pay taxes if they learn that the government spends a large portion of the budget on industrial subsidies. In contrast, the exposure of information about public spending on infrastructure and healthcare does not affect taxpayers' willingness to pay taxes.

These results suggest that the government should be cautious if its fiscal policies target specific groups. Although such policies may induce various favorable outcomes, such as promoting income redistribution and protecting infant industries, they could unintentionally entail an adverse effect on the reduction of tax payment behavior among citizens in the long run. Providing information about the fairness of fiscal exchange enables the government to not only demonstrate accountability and transparency, but also generates citizens' trust in authorities, which is another important factor of taxpaying behavior.

Our survey participants were recruited from a taxpayers list provided by the tax office. They consist of those who are registered by themselves or those identified by tax offices through

administrative monitoring schemes. Since the current tax monitoring scheme cannot detect a significant portion of non-compliant individuals in Indonesia, our sample does not include potential tax non-compliers outside of our list; this is a limitation of our study. Future research needs to be conducted to mitigate the potential problem of using narrower samples by including tax non-compliers into the sample, which could derive further insights into people's willingness to pay taxes.

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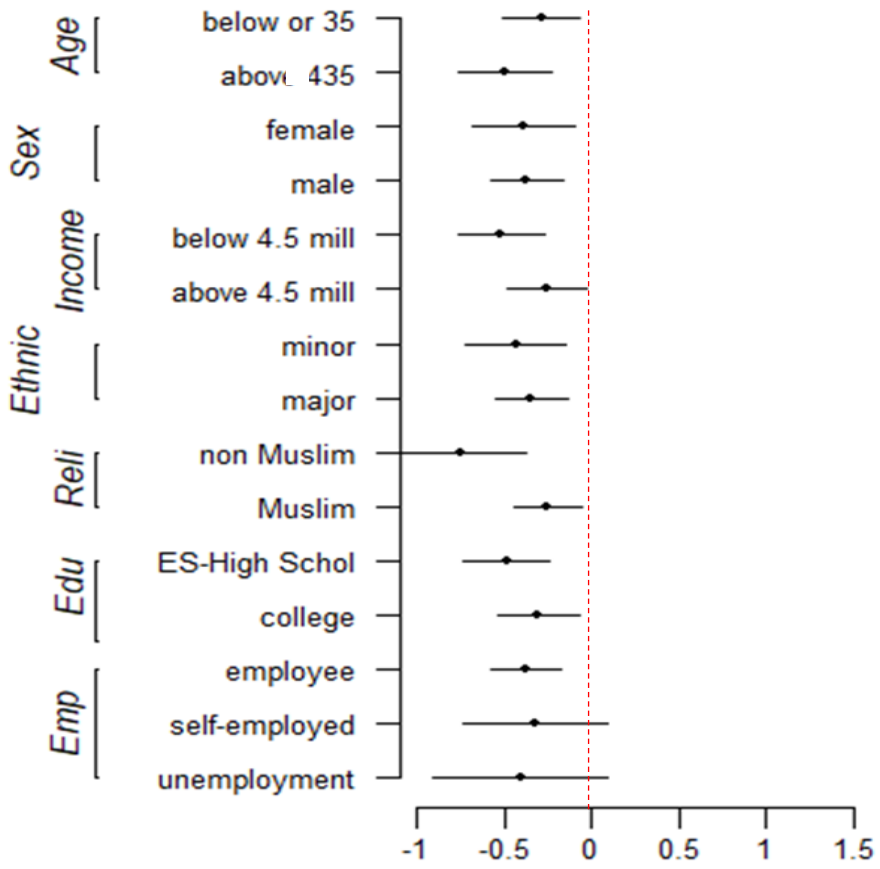
APPENDIX

Figure A3.1 Difference-in-means across individual characteristics in industrial subsidy group



Notes: Dots represent the estimated difference-in-means of the answers and lines show the 95% confidence interval. The vertical axis shows the respondents' attributes.

Table A3.1 Ordered probit model

	Full sample (1)		Infrastructure (2)		Healthcare (3)		Industrial subsidy (4)	
	Coef	S.E	Coef	S.E	Coef	S.E	Coef	S.E
Treatment								
Infrastructure	-0.07	0.10	-0.06	0.10				
Healthcare	0.07	0.10			0.07	0.10		
Subsidy	-0.37***	0.10					-0.36***	0.10
Age	0.06	0.08	0.14	0.11	0.09	0.11	0.02	0.12
Male	0.08	0.08	0.07	0.11	0.09	0.11	0.13	0.11
Major ethnic	0.05	0.08	0.03	0.11	0.07	0.11	0.11	0.11
Income	0.15*	0.08	0.11	0.12	0.02	0.11	0.09	0.11
Islam	-0.17*	0.09	-0.38***	0.13	-0.27**	0.12	-0.25*	0.13
Education	0.02	0.08	-0.07	0.11	0.01	0.11	-0.13	0.12
Employee	0.14	0.12	0.25	0.17	0.16	0.18	0.38**	0.18
Self-employed	0.20	0.14	0.06	0.19	0.38*	0.20	0.47**	0.19
/cut1	-1.22	0.17	-1.34	0.23	-1.23	0.23	-1.07	0.23
/cut2	-0.55	0.16	-0.80	0.23	-0.67	0.22	-0.49	0.23
/cut3	0.33	0.16	0.21	0.22	0.27	0.22	0.42	0.23
/cut3	1.81	0.17	1.62	0.24	1.71	0.24	1.83	0.25
Log likelihood		-1213.647		-593.40		-602.04		-615.91
N		879		437		442		440

Notes: The dependent variable is the willingness to pay taxes, from 1 (not at all) to 5 (a great deal).
***p<.01, **p<.05, *p<.1

Table A3.2 Multinomial logit model

	Full sample (1)		Infrastructure (2)		Healthcare (3)		Industrial subsidy (4)	
	Coef	S.E	Coef	S.E	Coef	S.E	Coef	S.E
Choice 2								
Treatment								
Infrastructur e	-0.42	0.26	-0.39	0.27				
Healthcare	-0.49*	0.27			-0.49*	0.27		
Subsidy	-1.05***	0.25					-1.10***	0.26
Age	-0.22	0.20	-0.18	0.29	0.01	0.31	-0.03	0.29
Male	-0.09	0.19	-0.01	0.28	-0.15	0.29	-0.07	0.27
Major ethnic	0.03	0.19	-0.20	0.28	-0.01	0.29	0.32	0.27
Income	0.24	0.20	0.30	0.30	-0.20	0.30	-0.20	0.29
Islam	0.06	0.24	-0.69*	0.38	0.39	0.35	0.14	0.33
Education	-0.04	0.20	-0.27	0.29	0.49	0.30	-0.41	0.29
Employee	-0.11	0.29	0.02	0.42	-0.05	0.45	0.66	0.41
Self-employed	-0.05	0.34	-0.46	0.48	-0.19	0.54	0.86*	0.46
cons	0.79*	0.41	1.54***	0.59	0.39	0.57	0.27	0.55
Choice 3								
Treatment								
Infrastructure	-0.29	0.26	-0.24	0.26				
Healthcare	-0.06	0.26			-0.06	-0.06		
Subsidy	-0.98***	0.25					-1.02***	0.25
Age	0.17	0.19	0.36	0.29	0.32	0.32	0.24	0.28
Male	0.16	0.19	0.24	0.28	0.14	0.14	0.21	0.27
Major ethnic	0.16	0.18	0.08	0.28	0.18	0.18	0.47*	0.26
Income	0.23	0.19	0.18	0.29	-0.18	-0.18	0.02	0.28
Islam	-0.32	0.22	-1.05***	0.37	-0.30	-0.30	-0.42	0.30
Education	0.11	0.19	0.04	0.29	0.22	0.22	-0.29	0.29
Employee	0.32	0.29	0.61	0.43	0.44	0.44	1.10**	0.43
Self-employed	0.49	0.33	0.09	0.48	0.82	0.82	1.32***	0.47
cons	0.29	0.40	0.73	0.59	0.24	0.24	-0.17	0.56
Log likelihood		-923.55		-450.44		-450.67		-574.26
N		879		437		442		440

Notes: We recoded the original coding of the Likert scale of the answers (1 - not at all, 5 - a great deal) into three-categorical variable. Choices 1 and 2 in the original dependent variable were recoded into 1 (as the baseline category), Choice 3 was recoded into 2, and Choices 4 and 5 were recoded into 3.
***p<.01, **p<.05, *p<.1

Chapter 4

Which strategies promote attitudes toward income tax? Testing enforcement, reciprocity, and peer-effect in the field

4.1 Introduction

Identifying the most effective approach to motivate individuals to pay their taxes is one of the key topics for scholars and governments worldwide (Andreoni et al., 1998). To ensure high taxpaying behaviors, tax authorities utilize various tax policy strategies from deterrence to moral suasion. However, the empirical evidence of each policy has not reached the same conclusion. The questions related to deterrence effects, particularly in the scope of audit probability, are the central in the tax literature (Andreoni et al., 1998). Some studies argue that deterrence is effective to motivate taxpaying (Castro & Scartascini, 2015; Pomeranz, 2015), while other studies find that audit has little effect and may not persistently encourage tax payment (Kastlunger et al., 2009; Mittone et al., 2017).

Likewise, tax morale also contributes to a significant portion of taxpaying attitudes through mainly two mechanisms. First, in a reciprocal argument, taxpayers expect that their tax money is spent appropriately by the government. The government provides the population's needs in return for the tax they paid (Feld & Frey, 2007). This mechanism will establish trust in the government. Second, from a peer-effect argument, an individual is more likely to pay taxes if other people pay taxes. There is a feeling of guilt if an individual behaves differently with others. There is much evidence that these two mechanisms influence individuals' tax behaviors (Alm et al.,2006; Alm & Torgler, 2006; Glaser & Hildreth, 1999; Hallsworth et al., 2017; Torgler, 2007; Luttmer & Singhal, 2014).

Relying upon different tax climates among countries, this study aims to identify the causal effect of deterrence strategy and non-deterrence strategy on people' perception of an individual's taxpaying behavior by conducting a vignette experiment in a developing country, Indonesia. We

particularly utilize perceived audit probability as a deterrence strategy and introduce two versions of the non-deterrence strategy: reciprocal and peer-effect arguments. We analyze the effect of reciprocity and peer-effect in a developing country where tax evasion is high and willingness to pay taxes is low, due particularly to low enforcement activities and a low level of trust in the government (Castro & Scartascini, 2015). The developing countries generally indicate the low performance of the government and its related outcome, including the quality of public goods and services. In addition, these countries have a limitation to monitoring and detecting non-compliance behaviors efficiently and effectively. Therefore, with this condition, people are reluctant to pay taxes. The non-compliance behaviors are rampant since one's behavior is followed by others, and eventually, this behavior becomes the norm (Andrighetto et al., 2016). On the other hand, in the countries that successfully generate the willingness to pay taxes, people are willing to pay their taxes because they are more likely to be triggered by the quality of public goods and services and influenced by their peers (Bergman & Steinmo, 2018; Castro & Scartascini, 2015). In this situation, the citizens perceive that the government matches their expectations, particularly concerning the provision of public goods and services. Moreover, the government is also capable of reinforcing the social norms of compliance in society. Since people already have higher compliance in these countries, some field experiments do not find significant results concerning the effect of reciprocity and peer-effect on people's willingness to pay taxes (Luttmer & Shinghal, 2014).

This study contributes to the growing tax literature in several ways. First, little is known about the effectiveness of perceived audit probability and moral suasion in improving people's perception of tax payment in the context of individual income tax. An exception may include the work of Bott et al. (2020) which analyzes the strategies in the scope of foreign income tax in Norway. In particular, most empirical researches on the strategies taken by tax authorities discuss only one particular strategy (Kleven et al., 2011; Lopez-Luzuriaga & Scartascini, 2019; Perez-Truglia & Troiano, 2018). Our study provides clear evidence of different effects of audit

probability and moral suasion in individual income tax. Second, to the best of our knowledge, no studies utilize real taxpayers` responses and apply a vignette experiment to explore people's perception on tax-paying behaviors of individual income tax in developing countries. Our study enriches tax literature by utilizing a vignette experiment which is popular in sociology and political science.

We conducted a vignette experiment applying a computer-assisted telephone interviewing (CATI) survey from November 2020 to March 2021. The respondents were individual taxpayers of the Bengkulu Province. We recruited survey respondents in collaboration with the tax authority, the Directorate General of Taxes (DGT) of the Indonesian government, and obtained responses from a total of 1,287 taxpayers. Our results find that the deterrence strategy encourages people's perception on tax-paying behavior. In addition, we also find that the effect of peer-effect information on the perception of an individual's taxpaying behavior depends on the context of the messages. The perception of an individual taxpaying's behavior is promoted by the information indicating that a significant portion of taxpayers honestly pay income taxes (positive peer-effect), while it is deteriorated by the opposite information indicating that a significant portion of taxpayers is dishonest (negative peer-effect). Concerning the reciprocal argument, the perception of taxpaying behavior is weakened by the information indicating governments' inefficiency in providing infrastructures and social services (negative reciprocity). On the other hand, the information indicating the government's administrative efforts in improving infrastructures and social services (positive reciprocity) does not affect people's perception on an individual's tax paying behaviors.

The remainder of this paper is organized as follows: Section 2 discusses the literature review, Section 3 provides brief information about the tax system in Indonesia, Section 4 describes the data, methodology and results, and Section 4 provides the conclusions.

4.2 Literature review

4.2.1 Deterrence approach

Allingham & Sandmo (1972) discuss the key components of deterrence: fine rate, audit probability, tax rate, income level, and taxpayers' preferences. They argue that the level of tax evasion is highly correlated with the risk of detection (audit probability), potential loss (fine rate), potential return (tax rate), and risk aversion. In this framework, taxpayers' attitudes to comply are considered under rational taxpayers who mind the cost-benefit decision (Alm et al., 2012). If they perceive that the potential return from evading taxes is higher than its potential loss, they will take the risk of being uncompliant. The probability of tax audit also is taken into account and becomes their consideration. If the probability of being caught is high, taxpayers are less likely to engage in tax evasion (Heinemann & Kocher, 2013).

It is noted that the effect of pecuniary approaches on tax attitudes is often shown with mixed results (Alm et al., 2012). However, an audit is consistently argued to ensure high tax compliance (Kirchler et al., 2008). A strong and positive effect of audit on tax attitudes is found in many tax literature (Ali et al., 2001; Alm et al., 1995; Pommerehne & Weck-Hannemann, 1996).

Tax fines is the consequences and results from tax audits, but the relationship between fines and tax compliance remains unclear. High tax fines give a signal that taxes are hazardous for taxpayers. The supporters of the positive correlation between tax fines and tax compliance (Friedland et al., 1978; Park & Hyun, 2003) argue that fines interact with higher audit probability (Alm et al., 1995). Yet, low- and high- income respond differently to the amount of tax fines which contributes to the less salient effect of fines on tax compliance (Ali et al., 2001; Kirchler et al., 2008). The more extreme case that fines encourage tax evasion is observed in several studies. It seems that either taxpayers look for the benefit from declaring lower tax due in return for high fines that they will be forced to pay later (Schwartz & Orleans, 1967) or tax enforcement increase the resistance among taxpayers (Fjeldstad & Semboja, 2001).

4.2.2 Morale approach

Regardless of the importance of economic consequences of deterrence approach, several criticisms are addressed that the enforcement solely is not sufficient to explain tax compliance in the real world (Christian & Alm, 2014). The scholars also recognize the issue of the high cost of enforcement (Slemrod, 1992), and thus, they consider another possible motivation to enhance tax compliance. As a result, there is an increasing interest in tax morale to explain the high level of voluntary tax compliance.

In the early phase, Schwartz & Orleans (1967) find out that moral suasions are much stronger than punishment, but this topic is under study. However, during the years, there have been tendencies of stressing tax morale in tax compliance literature. Erard & Feinstein (1994) point out that other motivations, namely moral sentiment, play an important role in shaping tax compliance. Therefore, there is an interesting piece of puzzle in this issue, such as the type of moral suasion that can influence moral sentiment and to what extent the level of compliance can be achieved.

There is much evidence that individuals' behaviors and their perception on tax paying behaviors are influenced by the social context in addition to financial context. Social norm characterizes behaviors that are judged in a similar way and are continued to exist in part in regard to social acceptance (Alm et al., 2012). They argue that social norm is consistent with a range of conceptual frameworks from various disciplines, including social influences, compliance, fairness, trust, and tax morale. From a tax compliance point of view, if other people comply, then an individual will also comply, and thus, the concept of peer effect is likely to work. In this way, there is a feeling of guilt if an individual behaves differently with others, particularly by cheating his tax. The social norm is then defined as intrinsic motivation to comply or tax morale because taxpayers' behavior to comply is generated by the concerns internally and not externally regulated by the government's enforcement (Alm et al., 2012; Braithwaite & Ahmed, 2005; Orviska & Hudson, 2003).

A good relationship between government and taxpayers should be maintained in a mutual environment where both parties are seen as partners. The government provides the needs for the population in return for the tax that they paid (Feld & Frey, 2007). In the norm reciprocity, a similar commitment and expectation from both parties are required and this is more important than a legal regulation (Alm et al., 2012). Here, taxpayers expect that their tax money is spent appropriately by the government. If the government spends the tax money wisely, trust in the government is more likely to increase. On the other side, the government trusts the taxpayers that they contribute to the provision of public goods and services by paying tax honestly. Any mistrust from each side will discourage the psychological contract of this relationship.

Several studies investigate the existence of tax morale, including social norm (or peer-effect) and the benefit from paying taxes that taxpayers receive in the form of public goods and services (reciprocity) in tax compliance with mixed results. Hallsworth et al. (2017) show that social norms and a positive reciprocity message work to accelerate tax payments. Bott et al. (2020) report that morale letters are only effective in increasing the amount of tax payment and robust across various groups of people. However, some studies show the ambiguity of peer effect information on an individual's compliance (Alm et al., 2017; Castro & Scartascini, 2015). They suggest that the various factors, including information context, respondents, and methodology, contribute to these results.

4.3 Empirical analysis

4.3.1 Individual income tax

This study focuses on taxes on individuals, particularly income tax, among various forms of taxes in Indonesia. Income tax is collected using a self-assessment system. There are two types of individual taxpayers: self-employed individuals and employees. Self-employed individual taxpayers calculate the amount of their own taxes and report it to the tax office. On the other hand,

for employees, income tax is calculated and paid by their employers from their salary or wage, using the withholding tax system. At the same time, employees often receive additional income from their own business activities in addition to their salaries or wages. Thus, all employees need to report incomes from their employers and their additional income to calculate the total amount of income tax they owe on their tax returns. However, due to the lack of third-party reporting to capture additional incomes from their business activities, taxpayers might not report all of their income on their tax returns, making honesty and willingness to pay taxes crucial for individual tax collection.

4.3.2 The vignette experiment

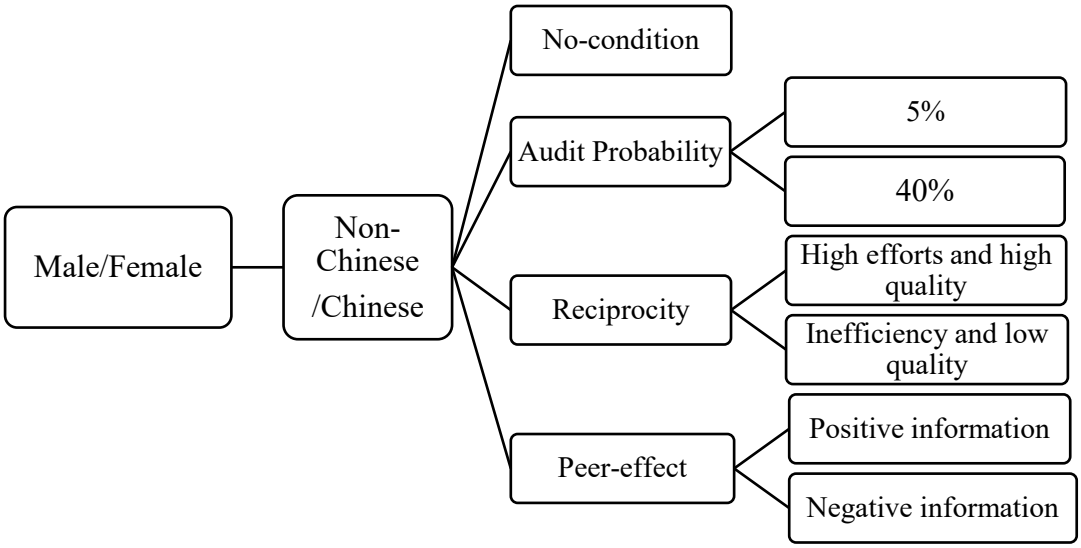
The vignette experiment describes brief scenarios which consist of dimensions and levels to manipulate respondents' perceptions. In our design, we presented the scenarios of hypothetical profit of a given fictional subject to all respondents. In addition, we manipulated the scenarios by adding several dimensions and several levels within a dimension. Specifically, we constructed three dimensions. The first and second dimensions correspond to two fictional subjects' characteristics: *gender* and *ethnicity*. There are two levels for gender (*male/female*) and ethnicity (*Chinese/non-Chinese*). We presented the first and the second dimensions to all respondents. The third dimension corresponds to the government's strategies: *no-condition, perceived audit probability, reciprocity, and peer effect*. For the *no-condition* strategy, we did not present any information of the government's strategies to a respondent. For the perceived audit probability strategy, we considered two levels and randomly presented a respondent with one of two audit probabilities, 5 percent (*low probability*) and 40 percent (*high probability*). Concerning the reciprocity strategy, we considered two levels and randomly presented a respondent with one of two types of information: one indicating high governments' administrative efforts with substantial improvement of infrastructure and social service (*positive reciprocity*) and the other indicating governments' inefficiency with less improvement of infrastructure and social service (*negative*

reciprocity). Regarding the peer effect strategy, we also considered two levels and randomly presented one of two types of information: one indicating that a significant portion of taxpayers pays income taxes (*positive peer-effect*) and the other indicating that a significant portion of taxpayers does not pay income taxes (*negative peer-effect*). Thus, for the third dimension, we have seven levels and we presented only one out of two audit probabilities strategies, two reciprocity strategies, or two peer-effect strategies. From our design, we have 28 vignette combinations (2 x 2 x 7). After these scenarios, we then asked all respondents to provide their opinions on the likelihood of whether the fictional subject paid income tax into a 10-point Likert scale (0 = "not at all" to 10 = "very sure").[1] By asking the respondents' perception of other people's behaviors, the vignette design tries to reduce the pressure among respondents to answer socially acceptable, and thus, it minimizes socially desirable responses (Blum et al., 2019; Finch, 1987).

We designed the vignette such that each level of dimension is randomly assigned to each respondent for each round (see Figure 4.1). The random assignment was programmed using Qualtrics in such a way that all the respondents were divided equally for all vignette combinations. To confirm the effectiveness of the randomization procedure, we conducted a balance test of randomization by applying the logit regression with the random assignment of the levels of first dimension (*male/female*) and second dimension (*Chinese/non-Chinese*) as dependent variable. For the third dimension (*strategies*), we checked the randomization between one of the three strategies (*deterrence*, *reciprocity*, or *peer-effect*) and *no-condition*, and between *high probability* and *low deterrence*, between *positive reciprocity* and *negative reciprocity*, and between *positive peer-effect* and *negative peer-effect*.[2]

[1] See appendix A1 for the vignette's wording.
[2] See appendix A2 for the balance test randomization.

Figure 4.1 The vignette's design.



We obtained approval from the Directorate General of Taxes (DGT) to access the taxpayers' list. The population included all 24,608 taxpayers regardless of their tax payments and filing status. In our sample, we excluded some categories (non-effective taxpayers and taxpayers with inaccurate phone numbers) as these taxpayers are unlikely to be contacted. Non-effective taxpayers do not need to file tax returns and pay taxes due to factors such as unknown addresses or having gone out of business. However, these taxpayers' statuses can be switched into effective taxpayers if these factors change, either by the taxpayer's requests or by tax officers' requests. This procedure resulted in 12,134 effective taxpayers with complete phone numbers. We experimented by sending messages to all 12,134 taxpayers linked to the Qualtrics platform in which we embedded the vignettes. We assigned vignettes in three rounds for each participant, and thus, with 1,287 respondents, we obtained 3,861 vignettes. The survey was conducted from November 2020 to March 2021. Our population was taxpayers in Bengkulu province, covering the capital city of Bengkulu and the other three regions. This province has nine regencies and an independent city of Bengkulu. The other two tax offices administer taxpayers in the six remaining regencies in the province.

To check whether our sample represents the population of individual taxpayers in the province, we compared our sample to the population of individual taxpayers in two categories, gender and age. The proportion of males is 64 %, similar to the taxpayers' population which is 60%. Regarding age, the proportion of taxpayers between 17 and 30 years old is very similar in both our sample and the population, which is 26%. Therefore, we believe that our sample could represent individual taxpayers' population, at least in these two categories. Taxpayers' data provided by tax offices did not include other individual characteristics, and thus we could not claim whether our sample may represent taxpayers' population in regard to other categories. The distribution of the sample is displayed in Table 4.1.

Table 4.1 Summary statistics

Variables	Obs	Mean	SD	Min	Max
Respondent's age (in years)	3,861	32.68	10.92	0	69
Respondent's gender (0= female, 1=male)	3,861	0.60	0.49	0	1
Respondent's ethnic					
- Jawa	3,861	0.16	0.37	0	1
- Batak	3,861	0.05	0.21	0	1
- Sunda	3,861	0.03	0.18	0	1
- Madura	3,861	0.01	0.12	0	1
- Betawi	3,861	0.01	0.10	0	1
- Other ethnic	3,861	0.68	0.47	0	1
Income (0= below 4.5 mil, 1= between 4.5 mil to 15 mil, 2= above 15 mil)	3,861	0.77	0.62	0	2
Religion					
- Islam	3,861	0.78	0.42	0	1
- Christian	3,861	0.04	0.21	0	1
- Buddhism	3,861	0.02	0.15	0	1
- Hinduism	3,861	0.03	0.17	0	1
- Other religions	3,861	0.02	0.16	0	1
Employment status					
- Employee	3,861	0.70	0.46	0	1
- Self employed	3,861	0.17	0.38	0	1
- Unemployment	3,861	0.06	0.24	0	1
Education (0=ES, 1=HS, 2= Bachelor"s degree, 3= Graduate degree)	3,861	2.74	0.69	0	3

4.3.3 Results

Data gathered via vignette experiment is hierarchically nested because the same participant gives three vignettes' judgments. To address this, we applied OLS regression with clustered standard error. The results of the OLS models are displayed in Table 4.2. We use several individual characteristics in our model. To measure the variables, we reconstruct the data as follows: *gender* (*male*=1; *female*=0), *ethnic* groups [*Jawa* (*Jawa*=1; non-Jawa =0), *Batak* (*Batak*=1; non-Batak=0), *Sunda* (*Sunda*=1; non-Sunda =0), *Madura* (*Madura*=1; non-Madura =0), *Betawi* (*Betawi*=1; non-Betawi =0)], *income* (*below 4.5 mil*=0; *between 4.5 mil and 15 mil*=1; *above 15 mil*=2), *religion* [*Islam* (*Islam*=1; non-Islam =0), *Christian* (*Christian*=1; non-Christian =0), *Buddhism* (*Buddhism*=1; non-Buddhism =0), *Hinduism* (*Hinduism*=1; non-Hinduism =0),] *education* (*elementary school* =0; *high school=1; bachelor's degree=2; graduate degree*=3), *employment status* [*employee* (*employee*=1; non-employee =0), *self-employed* (*self-employed*=1; non-self-employed =0)].

Table 4.2 OLS

Models	(1)	(2)
DV: The likelihood to pay	Coef	Coef
Chinese	-0.15*	-0.16*
	(0.08)	(0.08)
Male	0.03	0.04
	(0.08)	(0.08)
Audit probability		
- High - 40%	2.32***	2.15***
	(0.16)	(0.16)
- Low - 5%	1.41***	1.26***
	(0.14)	(0.14)
Reciprocity		
- positive	-0.07	-0.19
	(0.17)	(0.16)
- Negative	-0.75***	-0.91***
	(0.16)	(0.15)
Peer-effect		
- Positive	0.95***	0.79***
	(0.14)	(0.14)
- Negative	-0.38**	-0.53***
	(0.15)	(0.15)
R^2	0.12	0.16
Observations	3,861	3,861
Number of groups		
Individual attributes	No	Yes
Models	OLS (clustered std error)	OLS (clustered std error)

Notes: *p<0.1, **p<0.05, ***p<0.01.
Reference categories: no conditions, female, non-Chinese, other ethnicities, other religions, and unemployment. Full regressions are in Table A4.5.

The coefficient can be interpreted as the absolute changes of the dependent variable (the perception on the likelihood of paying income tax). In the first column (model 1), we run a regression with vignette dimensions only, while in the second column (model 2), we controlled for respondents' attributes.

First, as suggested by Alm and Malézieux (2021), we found that with both high and low audit probabilities approaches, people perceive that other people are more likely to pay tax compared to the control group, significantly at the 1% level. In particular, it was clear that the effect of high audit probability (40%) on the perception on tax-paying behavior was larger than low audit probability (5%). In other words, people's perception on tax-paying behaviors were enhanced significantly by higher audit probability information. Second, interestingly, the information regarding the high administrative efforts of government and the substantial improvement of the infrastructure and social services does not affect people's perception on tax-paying behavior. Perhaps some people did not believe the information presented about the high efforts of the government and the improvement of infrastructure and social services. However, the information regarding the inefficiency of government and less improvement of the infrastructure and social services negatively affected the perception on tax-paying behaviors, significant at a 1% level.

Third, similar to Hallsworth et al. (2017), the information on positive peer-effect significantly affected people's perception on tax-paying behavior positively, and it was 0.6 points larger than the control group. On the other hand, the negative peer-effect information negatively affected people's perception on tax-paying behavior. It was 0.6 points smaller than the control group. These results suggest that if a taxpayer believes that other taxpayers pay their taxes, an individual is perceived be more likely to pay its tax, *vice versa*. From model 2 of Table 4.2, we construct Figure A4.1, which clearly shows the estimated values and its confidence intervals for all conditions. This study also revealed that Chinese were perceived to have a lower likelihood to pay tax than native Indonesian and males' attitudes in tax-paying were not perceived differently than females' attitudes.

As robustness tests for our main findings, we performed random intercept regression (columns 3 and 4) and multilevel mixed-effect ordered logistic regression (columns 5 and 6) as shown in Table A4.4 (for full regression, see Table A4.5). Our robustness regressions mainly support the main findings of the OLS regression. One small difference is that positive reciprocity negatively affect people's perception on tax-paying attitudes in the random intercept model and multi-level ordered logit.

5 Conclusion

Analyzing various strategies to improve tax payment is crucial for tax authorities, particularly in developing countries. We employ a vignette experiment, where we inform different strategies to taxpayers.

Our results show that the deterrence strategy with perceived audit probability is consistent in pursuing higher perception of the people on tax payment. Intuitively, the negative reciprocity messages discourage the perception on tax payment and the peer-effect messages affect people's perception on tax payment behavior depending on the context of the message.

The results clearly will help the Directorate General of Taxes (DGT). Our results suggest that Indonesia's tax authority needs to employ enforcement and positive peer-effect information because it is highly effective in pursuing high tax-paying behavior in Indonesia. However, the government should bear in mind that societal benefit information may induce the opposite results. Therefore, this information should carefully be applied to minimize an adverse effect on people's attitudes toward tax payment.

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APPENDIX

A1. Vignettes' wordings and questions

1. Base/no condition.

   Imagine **Mr./Ms. A/B/C/D** run a family business in Bengkulu. Last year, **he/she** earned enough profit. Thus, **he/she** should pay his/her income tax.

   How likely does **he/she** pay income tax this year?
   (The answer is a scale from 0 (not at all) to 10 (very sure).

2. Audit probability.

   Imagine **Mr./Ms. A/B/C/D** run a family business in Bengkulu. Last year, **he/she** earned enough profit. Thus, **he/she** should pay **his/her** income tax.

   In the beginning of this year, tax office announced that they will audit on individual taxpayers. If **he/she** is identified by tax office that **he/she** cheats on **his/her** income tax, **he/she** will be punished by fined and penalty. There is a probability of **5%/40%** that **he/she** is being audited.

   How likely does **he/she** pay income tax this year?
   (The answer is a scale from 0 (not at all) to 10 (very sure).

3. Reciprocity.

   Imagine **Mr./Ms. A/B/C/D** run a family business in Bengkulu. Last year, **he/she** earned enough profit. Thus, **he/she** should pay **his/her** income tax.

   Due to the **government's administrative efforts/inefficient government**, tax revenue **has/has not** been efficiently used, so that there has been **a substantial/less** improvement of infrastructure (such as **high/low** quality of the highways and subways) and social services (such as **large/small** coverage of medical hospitals and national insurance programs). **If/Even he/she** pays income tax, **he/she** contributes/does not contribute to the socio-economic development of the country.

   How likely does **he/she** pay income tax this year?
   (The answer is a scale from 0 (not at all) to 10 (very sure).

4. Peer-effect.

   Imagine **Mr./Ms. A/B/C/D** run a family business in Bengkulu. Last year, **he/she** earned enough profit. Thus, **he/she** should pay **his/her** income tax.

   Recent researches confirmed that a significant portion of taxpayers **pays/do not pay** their income taxes.

   How likely does **he/she** pay income tax this year?
   (The answer is a scale from 0 (not at all) to 10 (very sure).

A2. Balance test of randomization.

Table A4.1 Balance test of randomization - Gender and Ethnicity

Variables	Gender		Ethnicity	
	Male vs. Female		Chinese vs. Non-Chinese	
	Coef	s.e	Coef	s.e
Respondent's age	-0.00	0.00	0.00	0.00
Respondent's gender	0.15**	0.07	0.03	0.07
Respondent's ethnic				
- Jawa	0.29	0.33	-0.13	0.33
- Batak	0.35	0.37	-0.34	0.36
- Sunda	0.33	0.37	-0.38	0.37
- Madura	0.43	0.42	-0.25	0.42
- Betawi	0.37	0.46	0.10	0.46
- Other ethnic	-0.03	0.27	0.10	0.27
Income	-0.02	0.07	0.11*	0.07
Religion				
- Islam	0.14	0.18	-0.09	0.18
- Christian	-0.02	0.24	0.22	0.24
- Buddhism	0.10	0.28	-0.23	0.28
- Hinduism	0.03	0.26	-0.38	0.26
- Other religions	0.21	0.33	-0.21	0.32
Employment status				
- Employee	-0.51*	0.28	0.37	0.28
- Self employed	-0.36	0.29	0.34	0.29
- Unemployment	-0.31	0.31	0.32	0.31
Education	0.08	0.05	-0.06	0.05
Log likelihood	-2668.14		-2668.44	

Notes: *p<0.1, **p<0.05, ***p<0.01.

Table A4.2 Balance test of randomization – treatment groups vs control group

Variables	Deterrence vs. control		Reciprocity vs. control		Peer-effect vs. control	
	Coef	s.e	Coef	s.e	Coef	s.e
Respondent's age	0.02	0.00	-0.01	0.06	-0.01	0.00
Respondent's gender	-0.18*	0.10	0.02	0.10	-0.12	0.10
Respondent's ethnic						
- Jawa	0.39	0.49	0.05	0.50	0.48	0.49
- Batak	0.16	0.54	0.17	0.53	0.48	0.54
- Sunda	0.16	0.53	-0.03	0.54	0.08	0.54
- Madura	0.47	0.59	-0.18	0.62	0.15	0.62
- Betawi	-0.21	0.67	-0.03	0.63	-0.24	0.68
- Other ethnic	0.47	0.48	0.15	0.49	0.61	0.48
Income	0.05	0.09	0.09	0.09	0.09	0.09
Religion						
- Islam	0.16	0.24	0.06	0.24	0.36	0.26
- Christian	0.25	0.35	0.39	0.32	0.51	0.34
- Buddhism	0.48	0.41	0.34	0.41	0.73*	0.42
- Hinduism	0.19	0.37	-0.10	0.38	0.67*	0.37
- Other religions	0.42	0.37	0.10	0.38	0.21	0.39
Employment status						
- Employee	-0.28	0.39	0.01	0.42	-0.46	0.39
- Self employed	-0.36	0.41	-0.06	0.43	-0.57	0.41
- Unemployment	-0.05	0.44	0.40	0.46	-0.21	0.44
Education	-0.11	0.07	-0.11	0.07	-0.13*	0.07
Log likelihood	-1300.88		-1296.63		-1296.74	

Notes: *p<0.1, **p<0.05, ***p<0.01.

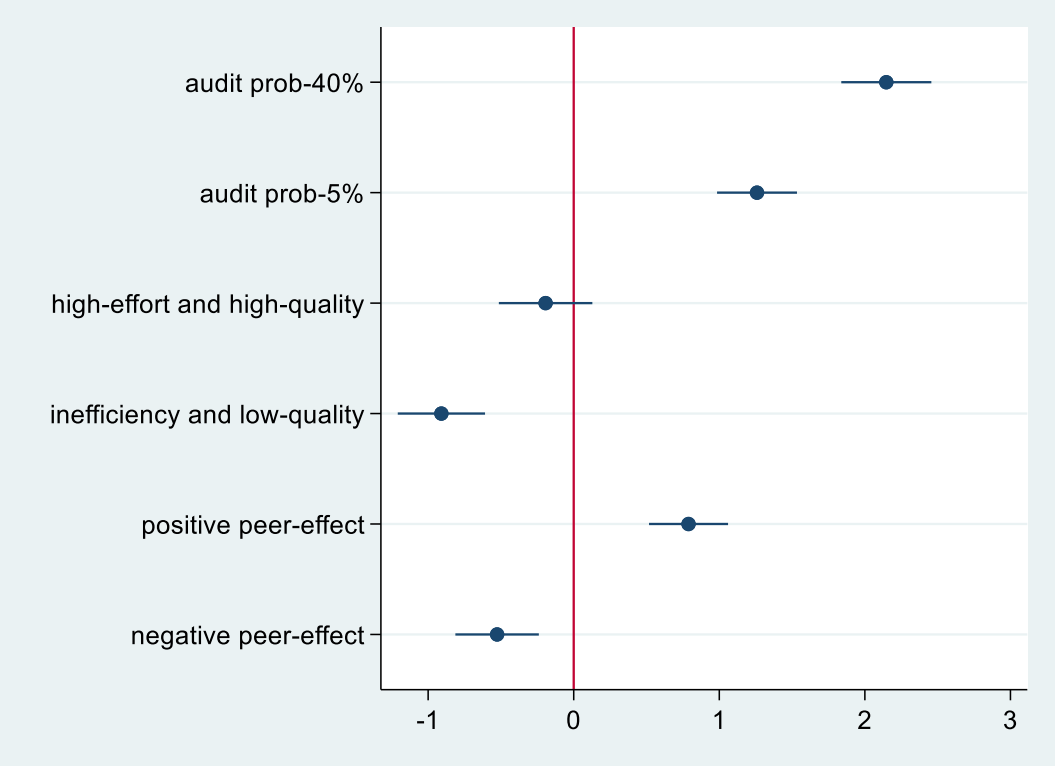
Table A4.3 Balance test of randomization – between levels of the treatment groups

Variables	Audit probability		Reciprocity		Peer-effect	
	High vs. Low		Positive vs. Negative		Positive vs. Negative	
	Coef	s.e	Coef	s.e	Coef	s.e
Respondent's age	0.01	0.01	0.00	0.01	-0.01	0.01
Respondent's gender	-0.11	0.14	-0.12	0.15	0.10	0.14
Respondent's ethnic						
- Jawa	1.10	0.73	0.10	0.74	1.10	0.72
- Batak	1.88**	0.83	-0.30	0.78	0.82	0.79
- Sunda	1.27	0.79	1.49*	0.81	0.76	0.80
- Madura	1.48*	0.87	0.22	0.93	2.00**	0.98
- Betawi	1.56	1.06	1.28	0.96	2.56*	1.31
- Other ethnic	0.08	0.51	0.69	0.54	-0.78	0.59
Income	-0.19	0.13	-0.16	0.14	-0.29**	0.14
Religion						
- Islam	-0.11	0.35	0.34	0.36	-0.57	0.39
- Christian	-0.96*	0.55	0.78*	0.47	-0.75	0.51
- Buddhism	-0.71	0.58	0.56	0.56	-0.32	0.57
- Hinduism	0.08	0.52	0.52	0.56	-0.79	0.52
- Other religions	1.02	0.71	0.39	0.73	0.87	0.71
Employment status						
- Employee	-0.74	0.56	-0.92	0.62	-0.38	0.55
- Self employed	-0.61	0.58	-1.00	0.65	-0.58	0.58
- Unemployment	-0.94	0.63	-0.98	0.67	-0.56	0.62
Education	0.06	0.10	-0.03	0.10	0.11	0.10
Log likelihood	-643.36		-636.12		-643.70	

Notes: *p<0.1, **p<0.05, ***p<0.01.

A3. The effect of each treatment on the likelihood to pay tax

Figure A4.1 The effect of each treatment on the likelihood to pay tax.



Notes: The dots are the coefficients of the treatments, and the lines show the 95% confidence intervals from the regression model in column 2 of Table 4.2.

Table A4.4 Robustness check – random intercept model and multi level ordered logit

Models	(1)	(2)	(3)	(4)	(5)	(6)
DV: The likelihood to pay	Coef	Coef	Coef	Coef	Coef	Coef
Chinese	-0.15*	-0.16*	-0.19***	-0.19***	-0.20***	-0.20***
	(0.08)	(0.08)	(0.07)	(0.06)	(0.07)	(0.07)
Male	0.03	0.04	-0.04	-0.03	-0.01	-0.01
	(0.08)	(0.08)	(0.07)	(0.06)	(0.07)	(0.07)
Audit probability						
- High - 40%	2.32***	2.15***	2.11***	2.06***	2.43***	2.38***
	(0.16)	(0.16)	(0.12)	(0.12)	(0.14)	(0.13)
- Low - 5%	1.41***	1.26***	1.16***	1.11***	1.23***	1.20***
	(0.14)	(0.14)	(0.11)	(0.11)	(0.12)	(0.12)
Reciprocity						
- positive	-0.07	-0.19	-0.32***	-0.37***	-0.43***	-0.46***
	(0.17)	(0.16)	(0.12)	(0.12)	(0.12)	(0.12)
- Negative	-0.75***	-0.91***	-0.94***	-0.99***	-1.13***	-1.19***
	(0.16)	(0.15)	(0.11)	(0.11)	(0.12)	(0.12)
Peer-effect						
- Positive	0.95***	0.79***	0.67***	0.62***	0.67***	0.63***
	(0.14)	(0.14)	(0.11)	(0.11)	(0.12)	(0.12)
- Negative	-0.38**	-0.53***	-0.57***	-0.61***	-0.69***	-0.72***
	(0.15)	(0.15)	(0.11)	(0.11)	(0.12)	(0.12)
R^2	0.12	0.16				
Observations	3,861	3,861	3,861	3,861	3,861	3.861
Number of groups			1,281	1,281	1.281	1.281
Individual attributes	No	Yes	No	Yes	No	Yes
Models	OLS	OLS	Random intercept	Random intercept	multi-level ordered logit	multi-level ordered logit

Notes: *p<0.1, **p<0.05, ***p<0.01.

A4. Full regression of Table 4.2 and Table A4.4.

Table A4.5 Full regression of the models in Table 4.2 and Table A4.4

Models	(1)	(2)	(3)	(4)	(5)	(6)
DV: The likelihood to pay	Coef	Coef	Coef	Coef	Coef	Coef
Vignettes (Level 1)						
Chinese	-0.19***	-0.19***	-0.15*	-0.16*	-0.20***	-0.20***
	(0.07)	(0.06)	(0.08)	(0.08)	(0.07)	(0.07)
Male	-0.04	-0.03	0.03	0.04	-0.01	-0.01
	(0.07)	(0.06)	(0.08)	(0.08)	(0.07)	(0.07)
Audit probability						
- High - 40 %	2.11***	2.06***	2.32***	2.15***	2.43***	2.38***
	(0.12)	(0.12)	(0.16)	(0.16)	(0.14)	(0.13)
- Low - 5 %	1.16***	1.11***	1.41***	1.26***	1.23***	1.20***
	(0.11)	(0.11)	(0.14)	(0.14)	(0.12)	(0.12)
Reciprocity						
- Positive	-0.32***	-0.37***	-0.07	-0.19	-0.43***	-0.46***
	(0.12)	(0.12)	(0.17)	(0.16)	(0.12)	(0.12)
- Negative	-0.94***	-0.99***	-0.75***	-0.91***	-1.13***	-1.19***
	(0.11)	(0.11)	(0.16)	(0.15)	(0.12)	(0.12)
Peer-effect						
- Positive	0.67***	0.62***	0.95***	0.79***	0.67***	0.63***
	(0.11)	(0.11)	(0.14)	(0.14)	(0.12)	(0.12)
- Negative	-0.57***	-0.61***	-0.38**	-0.53***	-0.69***	-0.72***
	(0.11)	(0.11)	(0.15)	(0.15)	(0.12)	(0.12)
Respondents (Level 2)						
Age		0.02***		0.02**		0.03***
		(0.01)		(0.00)		(0.01)

Male		0.03		0.03		0.06
		(0.13)		(0.12)		(0.15)
Jawa		0.43***		0.36**		0.56***
		(0.16)		(0.18)		(0.20)
Batak		0.10		0.08		0.14
		(0.34)		(0.28)		(0.41)
Sunda		-0.63*		-0.64***		-0.65
		(0.33)		(0.28)		(0.40)
Madura		-0.10		-0.11		-0.20
		(0.49)		(0.28)		(0.59)
Betawi		-0.20		-0.21		-0.18
		(0.59)		(0.51)		(0.72)
Income		-0.35***		-0.34***		-0.45***
		(0.11)		(0.12)		(0.14)
Islam		0.46**		0.41**		0.72***
		(0.22)		(0.19)		(0.27)
Christian		0.64*		0.60**		0.88*
		(0.38)		(0.30)		(0.46)
Buddhism		0.60		0.53*		0.90
		(0.45)		(0.31)		(0.55)
Hinduism		0.12		0.06		0.32
		(0.41)		(0.32)		(0.49)
Employee		0.31		0.30**		0.51**
		(0.21)		(0.24)		(0.26)
Self employed		-0.00		-0.00		0.11
		(0.25)		(0.27)		(0.30)
Education		-0.05		-0.02		-0.05
		(0.09)		(0.10)		(0.11)
R^2	0.12	0.16				
Intercept	5.41***	4.58***	5.19***	4.40***		
	(0.09)	(0.35)	(0.12)	(0.41)		
Observations	3,861	3,861	3,861	3,861	3,861	3.861
Number of groups	1,281	1,281			1.281	1.281
Models	Random intercept	Random intercept	OLS	OLS	multi-level ordered logit	multi-level ordered logit

Notes: *p<0.1, **p<0.05, ***p<0.01.

Chapter 5

Conclusion

Tax evasion is a sensitive problem at the individual level. Since taxpayers have a motivation to hide their tax evasion behavior, identifying their true behavior can be a crucial challenge for researchers as well as tax regulators. This is related to social desirability bias, where respondents attempt to answer survey questions in a socially desirable or acceptable manner, instead of revealing their actual opinions or behavior. In the context of taxation, this bias emerges when taxpayers pretend to meet their obligations by underreporting their incomes to the tax office. To identify the characteristics of taxpayers who engage in tax evasion behavior, this study mitigated the influence of social desirability bias by conducting a list experiment in Jakarta, Indonesia. The univariate analysis revealed that 13.4 percent of taxpayers have cheated on their taxes by underreporting their income on their tax returns. The results also uncovered clear evidence that tax evasion behavior varies depending on individual characteristics, such as age, gender, ethnicity, and employment status. The multivariate analysis generally confirmed the findings from the univariate analysis, though some differences found in the univariate analysis (such as those between religious groups and education levels) disappeared in the multivariate analysis.

Our list experiment outcomes may still underestimate the proportion of taxpayers who have engaged in tax evasion behavior. In a developing country like Indonesia, the percentage of taxpayers who actually cheated on their taxes could be larger than estimated in this study because of weak auditing capacity and legal system. However, we believe that our study has important implications for taxation policy because our results help identify potential targets for tax auditing to overcome the issue of a government's limited institutional capacities. Given that our results indicate that taxpayers who are old, male, corporate employees, and members of a certain ethnic

group tend to exhibit relatively low tax compliance, one possible tax policy could be for the DGT to cluster these groups of taxpayers as potential targets for tax auditing.

However, the DGT currently does not have all the necessary information on individual taxpayers due to constraints on its taxpayer database and administrative capacities. To address this practical limitation, the DGT needs to collect the necessary information on individual taxpayers by changing its taxpayer database structure and administrative management while at the same time carefully protecting taxpayers' privacy.

We believe that the relationship between tax evasion and individual characteristics found in our study would be useful information for both researchers and tax authorities who are interested in designing effective tax policies and auditing schemes to improve governance and revenue collection. At the same time, the ethical issues involved in targeting specific groups in the tax auditing process are also a matter of concern. The government and tax authorities need to be aware of these and set clear rules for the implementation of auditing and the appropriate handling of personal data.

Implementing fiscal policies needs to be accompanied by government accountability to the public, and people are interested in the relevance and implications of these policies. Some fiscal policies that broadly benefit people tend to be supported by the public or taxpayers due to their fairness in the reciprocity between those who contributed and those who were rewarded. This reciprocal balancing promotes a positive perception about the government's responsibility for the prosperity of the people. This fosters cooperative behavior among them, particularly through their tax payment contributions. Hence, the government needs to adequately address people's preferences to improve their motivation to pay taxes.

Given this argument, we conducted a vignette experiment to identify how people's willingness to pay taxes responds to information provision on the government's budget allocation into three important sectors: (i) healthcare, (ii) infrastructure, and (iii) industrial subsidy. The

results of our experiment indicate that taxpayers are not as willing to pay taxes if they learn that the government spends a large portion of the budget on industrial subsidies. In contrast, the exposure of information about public spending on infrastructure and healthcare does not affect taxpayers' willingness to pay taxes.

These results suggest that the government should be cautious if its fiscal policies target specific groups. Although such policies may induce various favorable outcomes, such as promoting income redistribution and protecting infant industries, they could unintentionally entail an adverse effect on the reduction of tax payment behavior among citizens in the long run. Providing information about the fairness of fiscal exchange enables the government to not only demonstrate accountability and transparency, but also generates citizens' trust in authorities, which is another important factor of taxpaying behavior.

Our survey participants were recruited from a taxpayers list provided by the tax office. They consist of those who are registered by themselves or those identified by tax offices through administrative monitoring schemes. Since the current tax monitoring scheme cannot detect a significant portion of non-compliant individuals in Indonesia, our sample does not include potential tax non-compliers outside of our list; this is a limitation of our study. Future research needs to be conducted to mitigate the potential problem of using narrower samples by including tax non-compliers into the sample, which could derive further insights into people's willingness to pay taxes.

Identifying an effective approach to motivate individuals to pay their taxes is one of the key topics for scholars and governments worldwide. To ensure high taxpaying behaviors, tax authorities utilize various tax policy strategies from deterrence to moral suasion. However, the effect of each policy varies. Therefore, analyzing various strategies to improve tax payment is crucial for tax authorities. To do this, we employ a vignette experiment, where we inform different strategies to taxpayers.

Our results show that the deterrence strategy with perceived audit probability is consistent in pursuing higher tax payment. While the two types of reciprocity messages discourage tax payment, the peer-effect message affects tax payment behavior depending on the context of the message.

The results clearly will help the Directorate General of Taxes (DGT). Our results suggest that enforcement and positive peer-effect information are effective in pursuing high taxpaying behavior. In contrast, societal benefit information may induce different results. Therefore, this information should carefully be applied to minimize an unexpected effect on people's attitudes toward tax payment.